Catalogue no. 85-561-MIE — No. 009
ISSN: 1707-5203
ISBN: 978-0-662-47172-1

Research Paper

Crime and Justice Research Paper Series

The Development of Police-reported Delinquency Among Canadian Youth Born in 1987 and 1990

By Peter J. Carrington, University of Waterloo

Canadian Centre for Justice Statistics,
Statistics Canada, Ottawa, Ontario, K1A 0T6

Telephone: 1 800 387-2231 Fax: 1 613 951-6615

Statistics Canada Statistique Canada

Canada

How to obtain more information

For information about this product or the wide range of services and data available from Statistics Canada, visit our website at www.statcan.ca or contact us by e-mail at infostats@statcan.ca or by phone from 8:30am to 4:30pm Monday to Friday at:

Toll-free telephone (Canada and the United States):	
Enquiries line	1-800-263-1136
National telecommunications device for the hearing impaired	1-800-363-7629
Fax line	1-877-287-4369
Depository Services Program enquiries line	1-800-635-7943
Depository Services Program fax line	1-800-565-7757
Statistics Canada national contact centre:	1-613-951-8116
Fax line	1-613-951-0581

Information to access the product

This product, catalogue no. 85-561-MIE, is available for free in electronic format. To obtain a single issue, visit our website at www.statcan.ca and select Publications.

Standards of service to the public

Statistics Canada is committed to serving its clients in a prompt, reliable and courteous manner. To this end, the Agency has developed standards of service which its employees observe in serving its clients. To obtain a copy of these service standards, please contact Statistics Canada toll free at 1-800-263-1136. The service standards are also published on www.statcan.ca under About us > Providing services to Canadians.

2008-00017/

Crime and Justice Research Paper Series

The Development of Police-reported Delinquency Among Canadian Youth Born in 1987 and 1990

Peter J. Carrington University of Waterloo

Published by authority of the Minister responsible for Statistics Canada

© Minister of Industry, 2007

All rights reserved. The content of this electronic publication may be reproduced, in whole or in part, and by any means, without further permission from Statistics Canada, subject to the following conditions: that it be done solely for the purposes of private study, research, criticism, review or newspaper summary, and/or for non-commercial purposes; and that Statistics Canada be fully acknowledged as follows: Source (or "Adapted from", if appropriate): Statistics Canada, year of publication, name of product, catalogue number, volume and issue numbers, reference period and page(s). Otherwise, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form, by any means—electronic, mechanical or photocopy—or for any purposes without prior written permission of Licensing Services, Client Services Division, Statistics Canada, Ottawa, Ontario, Canada K1A 0T6.

November 2007

Catalogue no. 85-561-MIE2007009

Frequency: Occasional

ISSN 1707-5203

ISBN 978-0-662-47172-1

Ottawa

Cette publication est disponible en français (nº 85-561-MIF2007009 au catalogue)

Statistics Canada

Acknowledgments

This research was supported by the Social Sciences Research Council of Canada and the Canadian Centre for Justice Statistics. I am indebted to Anthony Matarazzo, UCR Survey Manager, for his work in preparing the data for analysis, his assistance in facilitating my access to the data at the Canadian Centre for Justice Statistics, his advice on many aspects of the data analysis, his careful review of the findings and of earlier drafts of the report, and his generous support for this program of research. I gratefully acknowledge the work of Colin Babyak and Krista Collins in preparing the Soundex match quality codes; the assistance of Holly Johnson, Roy Jones, Craig Kuntz, Valerie Pottie-Bunge and John Turner in facilitating access to the data at the Canadian Centre for Justice Statistics; Jodi-Anne Brzozowski for supervising the latter stages of the project; and Pat Newcombe-Welch and the management of the South-Western Ontario Research Data Centre for facilitating my access to the data at that Centre. The report has also benefited from helpful comments on earlier drafts by Sandra Besserer, Jodi-Anne Brzozowski, Craig Grimes, Michael Martin, Karen Mihorean, Brenda Smith, Valerie Picketts, Adele Stang, Jacques Taillon, John Turner, Paul Verbrugge, and Chuck Walker. Any errors in the interpretation of the data are those of the author alone. The author would like to extend a special thank you to Danielle Baum for her indispensable work in preparing the Manuscript.

Note of appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

Table of contents

Acknowledgments 4

Abstract 6

Background 7

Findings 9

- Delinquency in the study population and the national population 9
- The age-crime curve 10
- Age and the prevalence of delinquency 12
- Sex and the age-specific prevalence of delinquency 13
- Age-specific prevalence of different types of offenders 16
- Cumulative and "lifetime" prevalence of delinquency 19
- Sex and the cumulative prevalence of delinquency 21
- Cumulative prevalence of different types of offenders 23
- Age and the rate of offending 24
- The onset of the delinquent career 30
- Sex and the age of onset 32
- Onset and the type of offence 33
- The duration of the delinquent career 35
- The duration of the career and the age of onset 38
- The amount of delinquent activity 40
- Delinquent activity and age of onset 44
- Specialization and versatility in offending 48
- Changes in the seriousness of offending over the delinquent career 54

Summary and conclusions 57

Methodology 60

- Data source: The Incident-Based Uniform Crime Reporting Survey 60
- Study population 61
- Population at risk 61
- Selection, matching, and weighting of UCR2 records 62

Bibliography 65

Endnotes 67

Appendix 1 72

Cumulative index 76

Abstract

This report examines the development over childhood and adolescence of the recorded criminal activity of two cohorts of Canadians, born in 1987 and 1990. The data are drawn from the Incident-Based Uniform Crime Reporting Survey (UCR2) for 1995 to 2005. During that period, the UCR2 received information on crime and offenders from police services in six provinces, which provided policing services to about half of the population of Canada. This is the first large-scale developmental study of delinquency in Canada based on police-reported data.

The results are generally consistent with the findings of similar research in other countries, and of earlier Canadian research based on court records. Recorded delinquency is fairly widespread among Canadian teenagers. By the 18th birthday, just under one-fifth of the 1987 birth cohort—one-quarter of boys and one-eighth of girls—had been recorded by police as chargeable in a criminal incident, although not all were formally charged. The research tracked children born in 1990 from the 5th birthday, and found that very few children under 12 were recorded by police as offenders.

Most child and adolescent offenders committed very few recorded offences, which were concentrated in the less serious types of crime: minor theft and other minor property offences, and minor assaults. A majority of offenders born in 1987 committed only one recorded offence up to their 18th birthday. A minority (10%) committed five or more recorded offences. These "chronic offenders" averaged 11 offences each, and were responsible as a group for almost half (46%) of all recorded crime committed by members of the cohort. There was little evidence of specialization in one type of crime by the offenders in this study, and most of that was in property offences. There was no evidence of a progression by individual offenders from less to more serious types of crime.

Catalogue no. 85-561-MIE2007009

Background

This is the first large-scale study in Canada which uses police-reported data to examine the development of criminal behaviour during childhood and adolescence. A companion study (Carrington et al., 2005) examines criminal behaviour during adolescence and early adulthood, using data from youth and adult court records. The study population whose recorded delinquency forms the subject matter of the present report consists of two groups of Canadian youth,[1] born in 1987 and 1990. Each person's police-reported delinquency is tracked for 10 years, beginning on his or her birthday in 1995 and ending on the day before the birthday in 2005. Those who were born in 1987 are tracked from their 8th birthdays until the day before their 18th birthdays, and those born in 1990 are followed from their 5th birthdays to the day before their 15th birthdays. Only those crimes committed and recorded within the jurisdictional boundaries of police services reporting to the Incident-Based Uniform Crime Reporting Survey (UCR2) during 1995-2005 are included in the study. On average, during the period from 1995 to 2005, 52% of the population of Canada lived in the parts of Canada included in this study.

In the past, most studies of delinquency[2] took as their unit of analysis either the delinquent individual or the delinquent act. Over the past two or three decades, a new approach to the study of delinquency and adult crime, called life-course criminology, has introduced a new unit of analysis: the delinquent or criminal career. The criminal career is defined as the sequence of criminal acts perpetrated by the same individual over his or her life. In practice, almost no research on criminal careers has had access to data on individuals' entire life-spans,[3] and almost all studies have been restricted to the period from childhood or early adolescence to the end of adolescence or some point during early- or mid-adulthood. Many criminal career studies, including the present one, restrict their study population to the members of one or a few *birth cohorts* – that is, persons who are all born in the same year, or in a few selected years - in order to study the development of criminal behaviour of a group or groups of persons who are all passing through the same part(s) of the life-course during the same historical period.

The study addresses the following questions concerning the development of criminality in Canadian youth:

- How much recorded crime are Canadian youth responsible for? What are the predominant types of recorded youth crime? How does the youth crime rate vary by the sex and age of offenders?
- What proportion of Canadian youth are involved in recorded crime? How does the level of participation vary over childhood and adolescence, by the sex of the offender, and by the type of crime?

- How much recorded crime does an average young offender commit during his or her childhood and adolescence? – and how much variation is there from the average? Do some young offenders commit very little crime, and others commit a great deal? Are the variations related to the age and/or sex of the young person? For example, is the average rate of offending higher or lower in childhood than in adolescence? Are there variations with age and/or sex in the rate of commission of different types of crimes?
- At what age do young people commit their first recorded crime? Does this tend to be during childhood or adolescence? Does this "age of onset" vary by sex? Does the first recorded offence tend to be a certain type of crime? Is there a relationship between the age of onset and the total amount of crime committed during the delinquent career?
- How much time elapses between the first and last recorded offences in the average delinquent career? Do these careers tend to continue for years or are they typically of short duration? Does the duration of the career vary with the sex of the offender? Does it vary with the age of onset?
- Do young offenders tend to specialize in one type of crime, or are they typically versatile in their recorded criminal behaviour?
- Do children and adolescents tend to "graduate" from less serious to more serious types of crime?

It should be emphasized that this study relies on police-reported data on alleged offenders and crime. Therefore, only those crimes which come to the attention of the police, and in connection with which a child or adolescent accused is identified, are included in the study. These persons are referred to in the report as "accused" or "alleged offenders", because the data indicate only whether a person was identified by police as an offender, i.e. was "accused", not whether he or she actually committed an offence. According to the 1999 General Social Survey on Victimization, which was conducted at approximately the mid-point of the period covered by the present study, 59% of criminal victimizations in Canada were not reported to the police (Besserer & Trainor, 2000). In addition, an unknown proportion of "victimless" crimes, such as drug crimes and public order crimes were not reported to police. According to the 1999 Uniform Crime Reporting Survey, 60% of criminal incidents recorded by the police were not "cleared": that is, no offender was identified (Canadian Centre for Justice Statistics, 2000).

The data were extracted from the information systems of police services in Canada which participate in the Incident-Based Uniform Crime Reporting Survey. During the period covered by the study, these respondents provided policing services to approximately half of the population of Canada, mainly in the provinces of Québec and Ontario. Therefore, the data are not necessarily representative of all of Canada. However, the youth crime rate and distribution of types of recorded youth crime in the parts of Canada included in this study do not differ substantially from the youth crime rate and types of youth crime for Canada as a whole. This issue is discussed in "Delinquency in the Study Population and the National Population", below.

Catalogue no. 85-561-MIE2007009

Findings

Delinquency in the study population and the national population

During the period from their 8th to their 18th birthdays, children and youth born in 1987 were responsible for 47 recorded offences[4] per 100 population, or approximately one offence for every two persons in the birth cohort, in the parts of Canada included in the study.[5] This does not necessarily mean that every second cohort member was an alleged criminal: some cohort members were allegedly involved in several criminal incidents and most were involved in none.

Looking only at the age range from 12 to 17 inclusive – i.e. the six years from the 12th birthday to the day before the 18th birthday – members of the 1987 cohort were responsible for approximately 45 recorded offences per 100 population, or one offence per 2.2 cohort members.[6] This is an average *annual* crime rate of 7.5 offences per 100 population. This *youth crime rate* is about 2% lower than the average national youth crime rate during the same period, which was approximately 7.7 offences per 100 youth.[7] The lower crime rate for the study population reflects the over-representation in the data of youth in Quebec, who had a lower recorded youth crime rate than youth in Canada as a whole.

Members of the study population born in 1990 committed less recorded crime, because they were observed at younger ages. During the period from their 5th to their 15th birthdays, children and youth born in 1990 were responsible for approximately 15 recorded offences per 100 population, for an average annual crime rate of 1.5 per 100 population, in the parts of Canada included in the study.[8] This cannot be compared with national data because they are not available for children aged 5 to 15 years. However, it can be compared with the crime rate of the study population born in 1987, if the comparison is restricted to the age range which these two cohorts have in common, namely the ages of 8 to 14 inclusive. During these seven years, members of the 1987 birth cohort had an average annual crime rate of 2.4 offences per 100 population; and members of the 1990 birth cohort had an average annual crime rate of 2.1 per 100 population. The higher crime rate for the 1987 birth cohort between the ages of 8 and 14 reflects the higher youth crime rates in Canada during 1995 and 1996, when they were 8 and 9 years old but members of the 1990 cohort were only 5 and 6 years old.

The types of offences committed by members of both cohorts in the study population are shown in the first two columns of Table 1. The offence distributions shown in Table 1 are based on the most serious offence allegedly committed in the incident, so less serious offences may be under-represented, relative to more serious offences. The distribution of offences committed by members of both cohorts can be compared with the national distribution reported in the aggregate UCR Survey for Canadian children and youth in general, over the same period, which is shown

in the last column of Table 1. The distribution of recorded offences into the three broad categories of offences against the person,[9] against property, and other offences,[10] is similar for the study population born in 1987, and for all Canadian youth. However, the study population born in 1987 has a lower proportion of "other *Criminal Code*" offences and of indictable property offences, and higher proportions of offences against the person (except common assault), some property offences, and drug offences. The distribution of offences among the study population born in 1990 is considerably different from the other two groups, reflecting the less serious crime which is characteristic of the younger age range of the 1990 birth cohort: it has higher proportions of minor assaults, minor thefts and minor mischief.

Table 1

The distribution of types of recorded offences committed by the study population and by all Canadian youth, 1995 to 2005

Type of offence	1990 cohort 5 to 15 years	1987 cohort 8 to 17 years	All Canadian youth Less than 18 years
		percent	
Assault level 1 (common assault)	12.2	9.3	9.9
All other offences against the person	7.8	8.5	6.5
Subtotal – offences against the person	20.0	17.8	16.4
Break and enter, theft over $5,000	7.4	9.7	12.7
Possess stolen property, fraud	4.5	6.2	4.5
Theft under $5,000	30.4	23.8	21.3
Mischief under $5,000	13.0	9.1	8.8
Subtotal – offences against property	55.3	48.9	47.3
Other *Criminal Code* offences	16.6	21.0	27.0
Controlled Drugs and Substances Act	6.6	9.5	6.2
Other Federal statutes	1.5	2.8	3.1
Subtotal – other offences	24.7	33.3	36.3
Total percent of accused persons	**100.0**	**100.0**	**100.0**
Total number of accused persons	**31,588**	**91,491**	**2,374,156**

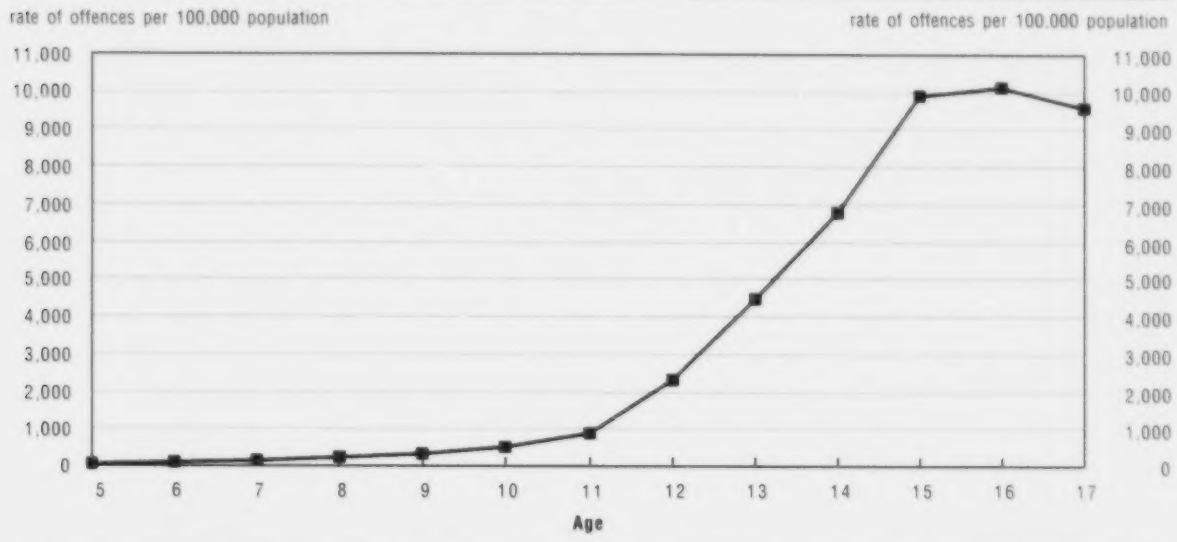
Sources: Statistics Canada, Canadian Centre for Justice Statistics, Aggregate Uniform Crime Reporting Survey, 1995 to 2005 and Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

The age-crime curve

The amount of recorded crime committed by members of the study population at different ages follows the familiar "age-crime curve". Chart 1 shows the crime rates per 100,000 population at each age from 5 to 17. The difference between the age-crime curves for the two birth cohorts over the age range where they overlap (8 to 14 years) is very small, and is statistically non-significant for most age groups.[11] The crime rates shown for 8 to 14 year olds are the averages for the two birth cohorts. The recorded crime rate is extremely low for 5 year old children (37 offences per 100,000 population) and rises slowly to 890 offences per 100,000 at the age of 11. From 11 years of age, it rises with increasing speed to a peak of 10,111 per 100,000 at 16 years, after which it begins to fall. This relationship between age and crime is so consistent with findings reported for different countries, periods of time, and different ways of measuring criminal activity that it has been claimed that it is invariant across social and cultural conditions (Hirschi & Gottfredson, 1983). The age-crime curves for males and females are broadly similar, but the level of crime by females is of course much lower, and peaks a year earlier (Chart 2).

Chart 1

The age-crime curve for the combined 1987 and 1990 birth cohorts

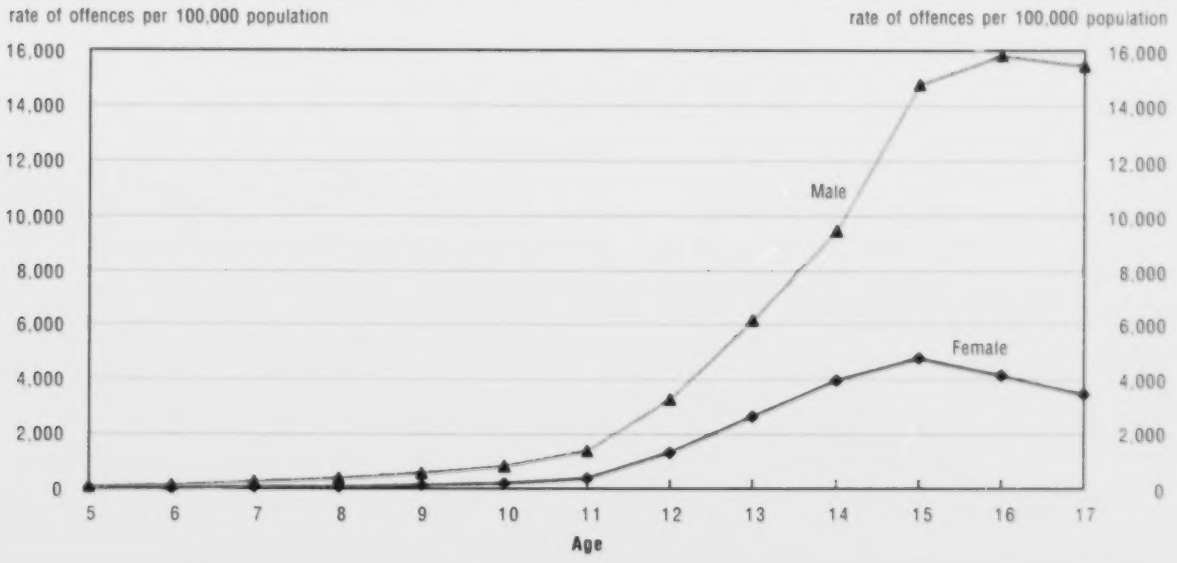


Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 2

Age-crime curves for the combined 1987 and 1990 birth cohorts, by sex



Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

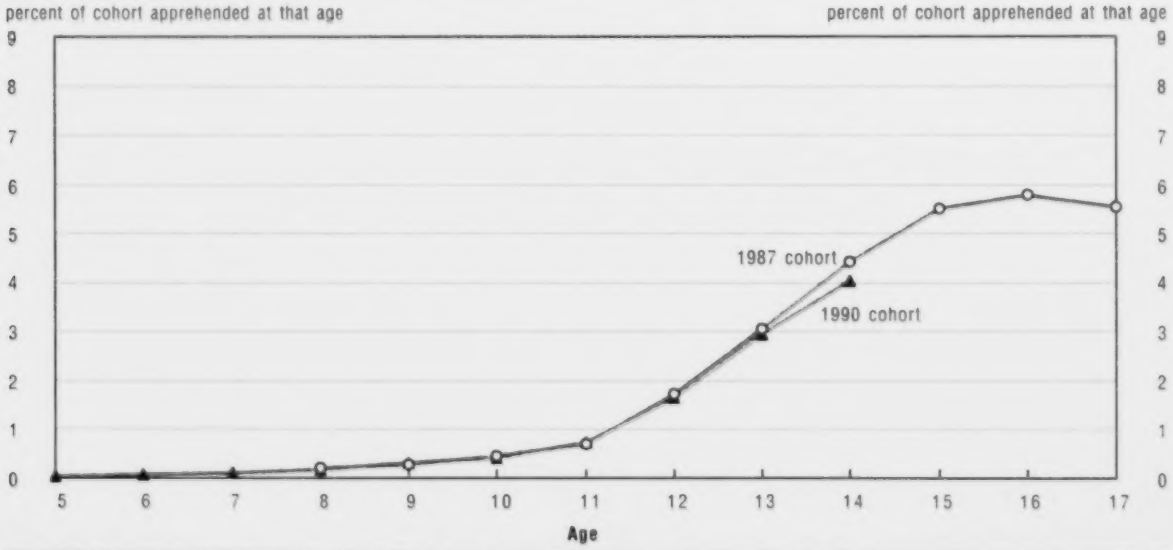
The crime rates and percentage distributions reported above were calculated by counting each involvement in a criminal incident of each youth in the study population. Therefore, if a youth was involved in several incidents, he or she would be counted more than once in the statistics. This method of counting gives an accurate count of the total number and distribution of involvements in recorded crime, but it does not provide information on how many different youths are involved in recorded crime, nor how many offences of which types each youth is involved in. Theoretically, all 91,491 offences recorded over the 10 year period which involved persons born in 1987 could have been committed by the same person; or they could have been committed by 91,491 different people, or by any combination of the same and different individuals. In order to determine how many different individuals were involved in recorded delinquency during the period of observation, all the incidents involving the same youth were linked together. This procedure resulted in a new unit of analysis: the chronological series of recorded incidents in which a youth is involved, also known as the youth's *delinquent career*.

Age and the prevalence of delinquency

Chart 3 shows the proportions of each birth cohort who were identified by police as offenders, at each year of age. The trajectories for the two cohorts are so similar that they can be treated as coming from the same population.[12] Participation in police-reported crime is very low at the younger ages: only 0.033%, or one in every 3,000 5 year olds, were recorded by police as being implicated in a crime.[13] Participation increases slowly to the age of 11, when 0.7% of the combined cohorts, or one in every 140 members, were apprehended by police. After the age of 11, the prevalence of recorded criminal behaviour increases much more rapidly. At the peak age of 16, 5.8%, or one in every 17 members of the 1987 cohort were apprehended by police. There is little difference in the level of participation in recorded delinquency among 15, 16, and 17 year olds.

Chart 3

The prevalence of recorded delinquency from ages 5 to 17, by cohort



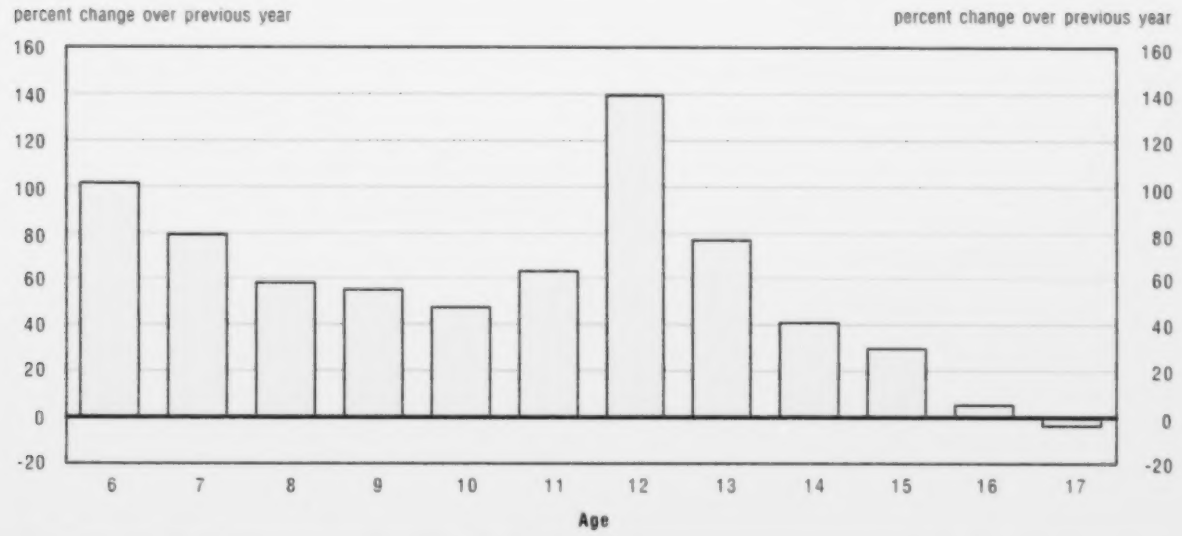
Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Catalogue no. 85-561-MIE2007009

Chart 4 shows the rate of change in prevalence of recorded delinquency, relative to the level in the preceding year.[14] The very large increase of 139% from 11 to 12 years old may reflect under-recording of crime committed by children younger than 12, rather than a sudden increase among 12 year olds, since it is unlikely that the twelfth birthday would induce a large increase in actual criminal activity. Rather, under the legislation in force during this period (the *Young Offenders Act* and *Youth Criminal Justice Act*), the minimum age of criminal responsibility was 12 years old at the time of the alleged offence. Police were unable to lay a criminal charge against identified offenders who were less than 12 years old. This may have affected both their identification of children as offenders, and their recording of such identifications.[15] Apart from the large increase at 12, *relative* increases in participation are greatest at the youngest ages – 6 and 7 years. After the age of 12, relative increases in participation decrease rapidly, becoming negative at 17.

Chart 4

Relative changes by year of age in the prevalence of recorded delinquency, 6 to 17 years of age



Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

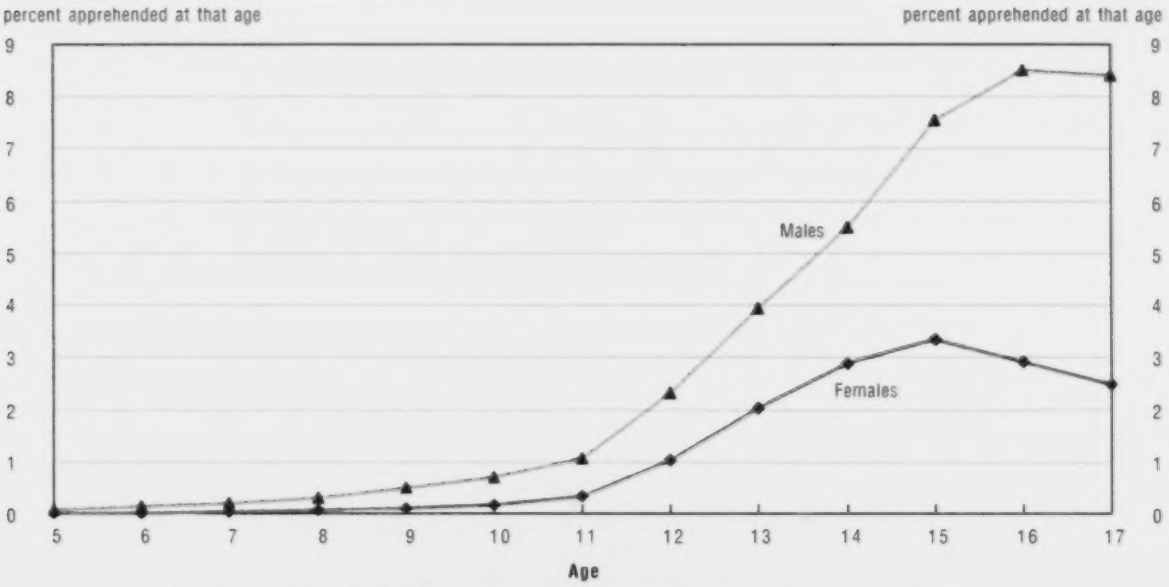
Sex and the age-specific prevalence of delinquency

In Chart 5, participation in recorded crime is broken down by the sex of the alleged offender.[16] As is found by all sex- and gender-specific research on crime, the prevalence of male delinquency is much higher than that of females. Overall, 68% of recorded offenders in the two birth cohorts were male, and 32% were female, for a sex ratio of 2 to 1. The prevalence of recorded delinquency among males is greater at all ages included in this study. At 15 years old – the peak age of female participation in delinquency – 7.6% of boys, but only 3.3% of girls, were identified as offenders. Among 5 year old boys, 0.06%, or one in 1,700 was apprehended; the comparable figure for girls is 0.006%, or one in 18,000. The age-related trajectory for males has

a similar shape to that for the combined sexes shown in Chart 3. This is not surprising, since the population of identified offenders is numerically dominated by boys. There is a small difference between the boys and the combined group at the age of 17, where the combined trajectory (Chart 3) falls off faster than the male trajectory. The reason for this can be seen in the female trajectory, which peaks at 15, and declines thereafter.

Chart 5

The prevalence of recorded delinquency from ages 5 to 17, by sex



Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

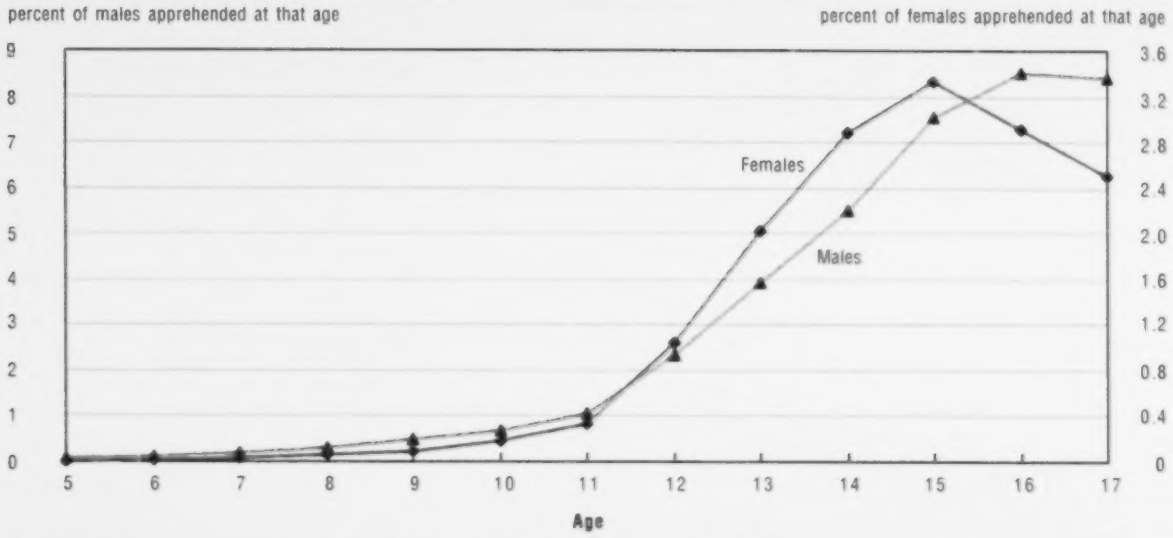
The similarities and differences between the shapes of the male and female participation trajectories can be seen more clearly in Chart 6, where they are plotted on different scales to control for the difference in level. The shapes of the trajectories are very similar up to the age of 11. From 11 to 13, it is the rate of participation of females which increases more rapidly, relative to level, than that of males. For example, the ratio of rates of apprehension of 12 to 11 year old girls is 3 to 1; whereas for boys the ratio is only 2.2 to 1. The ratio of the rates of 13 year old offenders to 12 year olds is 1.9 to 1 for girls and 1.7 to 1 for boys; and for 14 year olds compared to 13 year olds, the ratio is 1.4 to 1 for both sexes.

Although the prevalence of recorded delinquency is higher among males than females at all ages, the relationship between the prevalence of male and female offenders varies with age. This is shown in Chart 7 by the sex ratio: the ratio of the rate of recorded male prevalence to that of female offenders. It is highest for young children, and declines to a minimum at 14 years, after which it begins to rise again. More than 10 times as many 5 year old boys as girls were apprehended, but only 1.9 times as many 14 year old boys as girls.[17]

Catalogue no. 85-561-MIE2007009

Chart 6

The prevalence of recorded delinquency from ages 5 to 17, by sex (females scaled up)

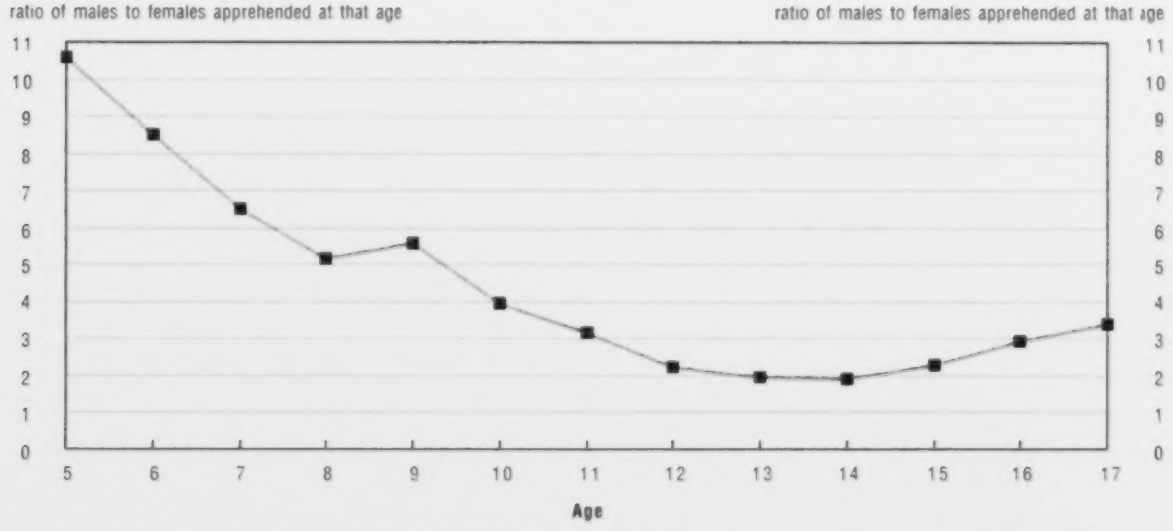


Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 7

The sex ratio of prevalence of recorded delinquency from ages 5 to 17



Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

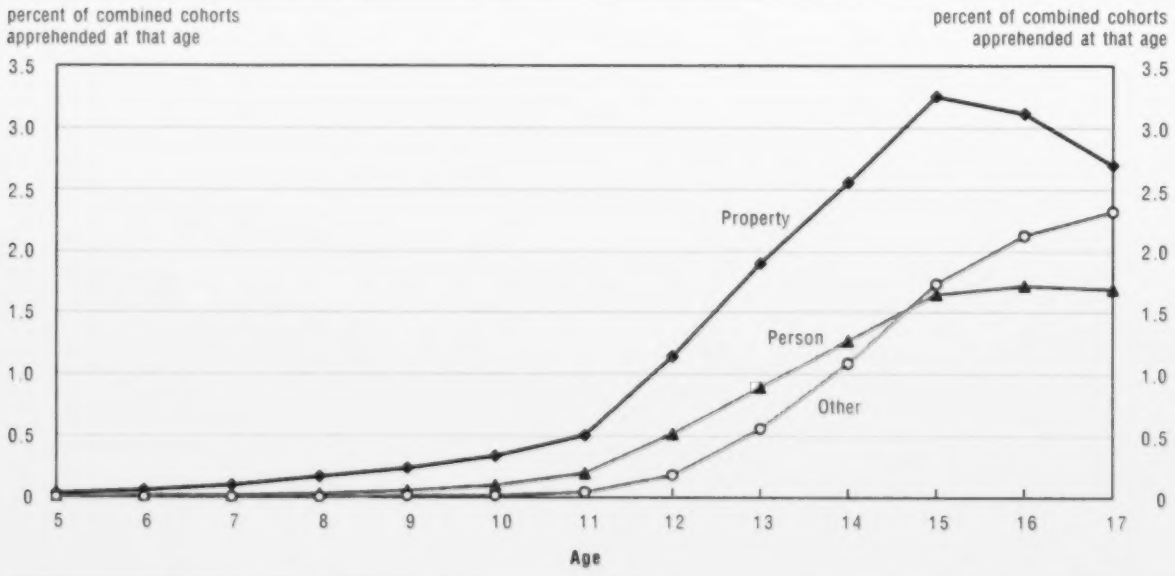
Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Age-specific prevalence of different types of offenders

Chart 8 shows the proportions of the combined cohorts who were apprehended by police at each age, differentiated by the most serious type of offence allegedly committed in the incident. The types of offences are grouped into offences against the person, offences against property, and other offences. "Other" offences include other *Criminal Code* offences, drug offences, and violations of other federal statutes (see Appendix Table A.1). Consistent with other research, the level of property crime is highest at all ages included in this study. The trajectories for the prevalence of the three types of offenders are all roughly similar in shape to the trajectory for all types of crime combined (Chart 3), but there are variations. The prevalence of property offenders rises most quickly with age, peaks at 15, then begins to decline quite sharply. The prevalence of offenders implicated in crimes against the person peaks at 16 years of age. The prevalence of persons implicated in "other" crimes is particularly low for children below 12 years old, but rises fairly rapidly in the teenage years, overtaking the prevalence of offenders against the person at 15 years, and approaching the prevalence of property offenders among 17 year olds. Unlike the other two types of crime, the prevalence of persons committing "other" crimes is still rising steeply at the end of the period of observation.

Chart 8

The prevalence of recorded delinquency from ages 5 to 17, by type of offence



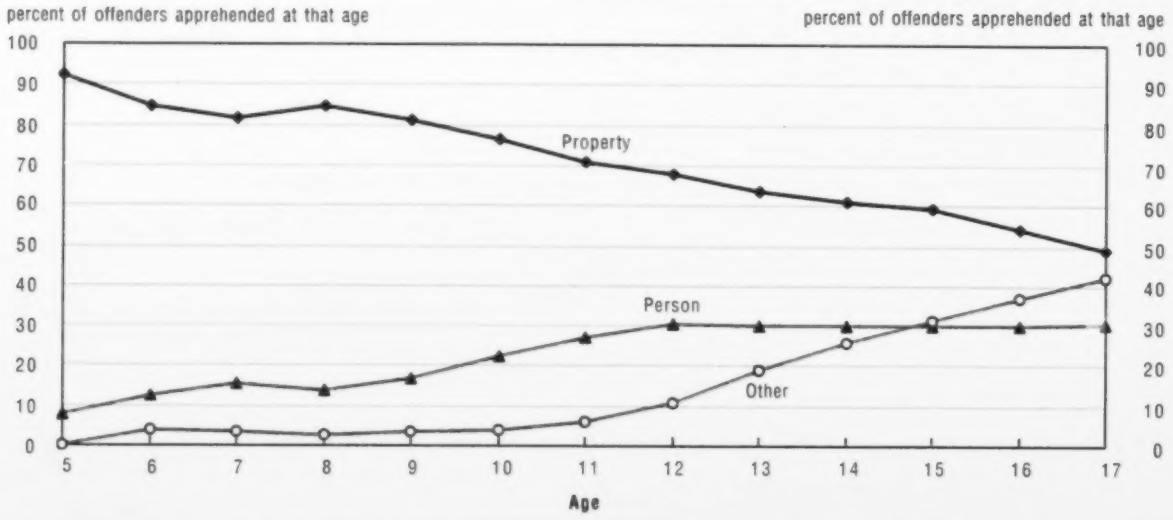
Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

In summary, property offenders are more prevalent at all ages from 5 to 17, but the proportion of property offenders decreases during the entire age range: from more than 90% at 5 years old to 50% at 17 (Chart 9). The proportion of offenders who were implicated in offences against the person rises from less than 10% at 5 years old to a peak of 30% at – interestingly – 12 years old, and remains at that level for the remainder of the period of observation. The proportion of "other" offenders is zero at 5 years old, and remains low until the age of 10. It then begins to increase fairly steeply, to 42% at 17, and shows no signs of levelling off. This is in spite of the downward bias in the statistics for "other" offences noted above, which is caused by the "most serious offence in the incident" recording rule.

Chart 9

The proportions of recorded offenders, by the age of the offender and the type of most serious offence, 5 to 17 years



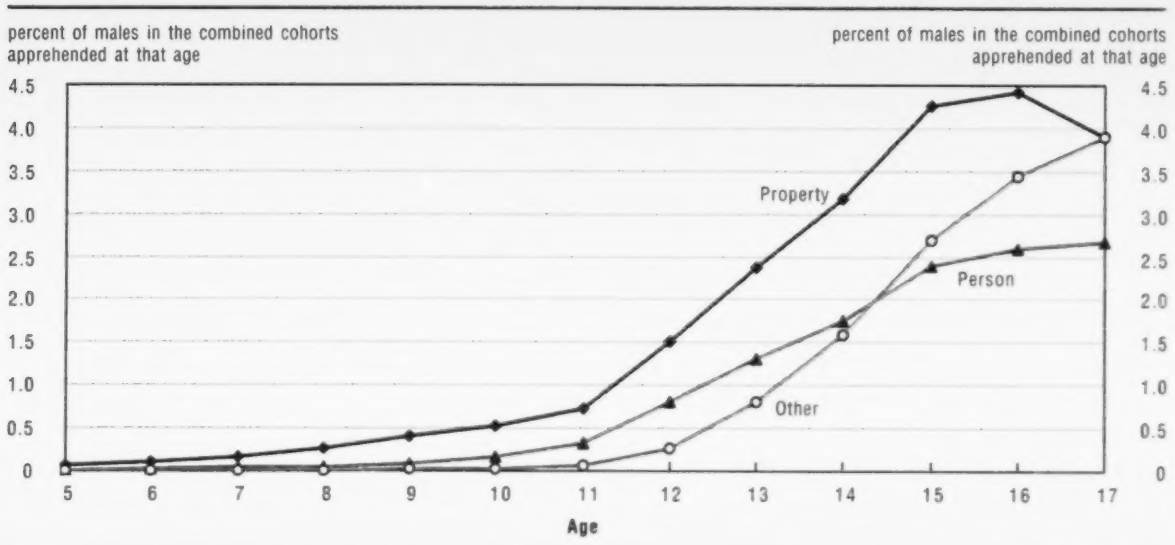
Notes: Percentages add to more than 100%, since a person may participate in more than one type of crime at a given age.
Based on averaged rates for the two cohorts for ages 8 to 14.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

The increase with age in the relative prevalence of "other" offenders is particularly marked in boys (Chart 10), among whom the prevalence of "other" offenders is the same as that of property offenders (3.9%) by the age of 17. Chart 10 also shows that the prevalence of boys apprehended for person and "other" offences is still rising at 17; whereas the prevalence of those accused of offences against the person reaches its peak at 16 in the combined group (Chart 8). In contrast, the trajectories of prevalence of all three types of female offenders peak before the age of 17 – at 15 for female person and property offenders, and at 16 for "other" offenders - and decrease thereafter: quite sharply in the case of property offenders (Chart 11).

Chart 10

The proportions of recorded male offenders, by the age of the offender and the type of most serious offence, 5 to 17 years

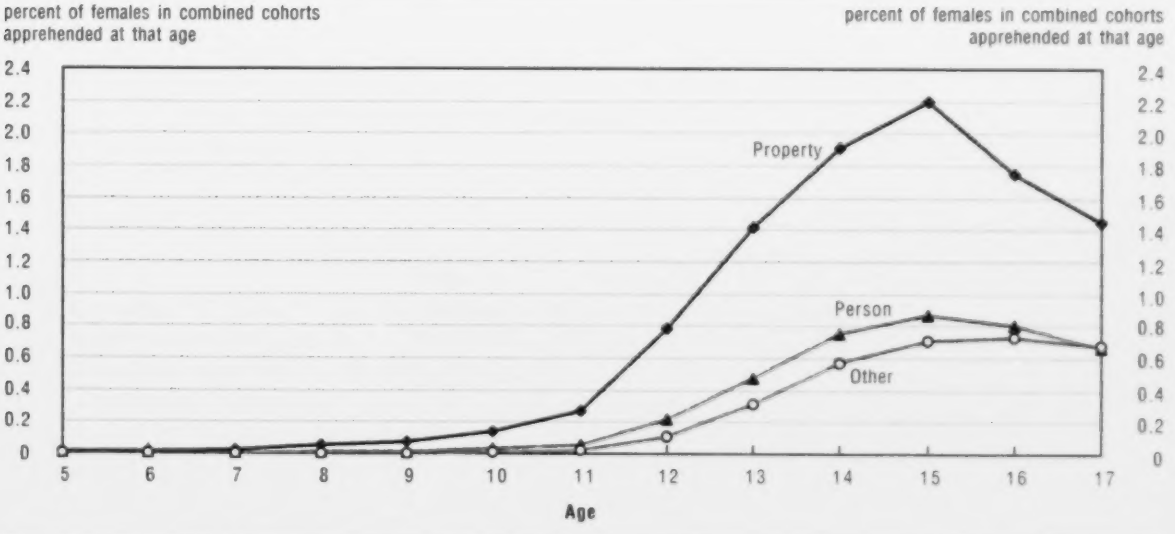


Note: Based on averaged rates for the two cohorts for ages 8 to 14.

Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

Chart 11

The proportions of recorded female offenders, by the age of the offender and the type of most serious offence, 5 to 17 years



Note: Based on averaged rates for the two cohorts for ages 8 to 14.

Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

Cumulative and "lifetime" prevalence of delinquency

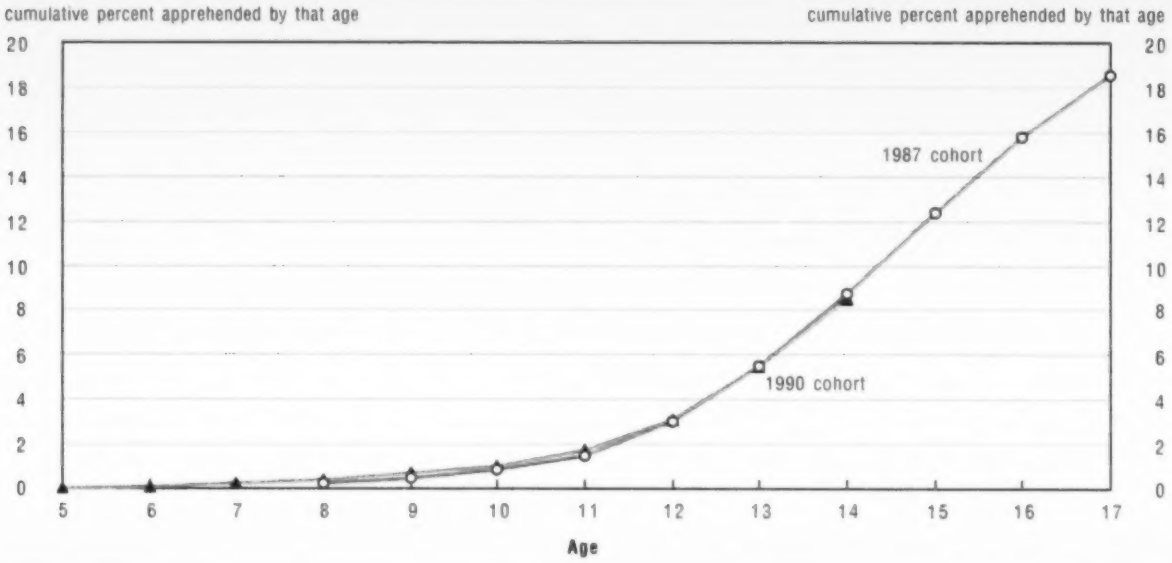
While age-specific prevalence statistics give an idea of the development with age of delinquent and criminal activity in the population, they do not show the cumulative effect of this development. For example, knowing (from the section above on the age-specific prevalence of offending) that 0.033% of 5 year olds and 0.067% of 6 year olds were identified as offenders does not determine what proportion of the cohort were ever identified as offenders before their seventh birthday. The number is somewhere between 0.067% and 0.100% (assuming that none of them was apprehended before their 5th birthday): the lower figure if all the apprehended 6 year olds were also apprehended as 5 year olds, and the higher figure if none of them were apprehended as 5 year olds. Thus, in order to estimate the *age-specific cumulative prevalence* of identified offenders in the cohort – that is, the proportion of the cohort who were ever identified as offenders up to and including a given age – it is necessary to eliminate double- or multiple-counting of persons who commit crimes at different years of age. Perhaps most interesting to know is the proportion of the cohort who were *ever* identified as offenders, during the period covered by the study. This *ever-prevalence*, or *lifetime prevalence*, is the same as the age-specific cumulative prevalence at the last year of age covered by the study.

Chart 12 shows the cumulative prevalence of identified offenders in each cohort, by year of age. The proportion of the cohorts ever identified as offenders rises from 0.033% of 5 year olds, or one in every 3,000 cohort members, to 18.5%, or just under one-fifth of cohort members, by the 18th birthday. This finding is consistent with similar research conducted in other countries (reviewed in Piquero et al., 2003), and with Canadian research based on youth court records (Carrington et al., 2005).

Prior to the 13th birthday, and especially prior to the 10th birthday, the recorded cumulative prevalence of offenders is lower in the 1987 cohort than in the cohort born in 1990. The probable reason for this is that there are no data on offending prior to 1995, and therefore no data on offending by members of the 1987 cohort prior to their 8th birthdays. Fortunately, the cumulative prevalence of offenders before the 8th birthday is so small (0.22% of the 1990 birth cohort) as to be insubstantial, and the resulting underestimation of cumulative offending in this cohort appears to have cleared up entirely by the age of 13, where the two curves converge at 5.5%.[18] Apparently, most if not all of those in the 1987 cohort who would have appeared in the statistics if there had been data for years prior to 1995, were also recorded as offenders between the ages of 8 and 13, with the result that they were belatedly added to the cumulative prevalence counts. Therefore, the approach used in the following analyses of cumulative prevalence (which differs from the approach used in the discussion of age-specific prevalence in the previous chapter) is to report proportions of the cohort born in 1990 for the ages of 5 to 13, and of the 1987 cohort thereafter.

Chart 12

The cumulative prevalence of recorded delinquency from ages 5 to 17

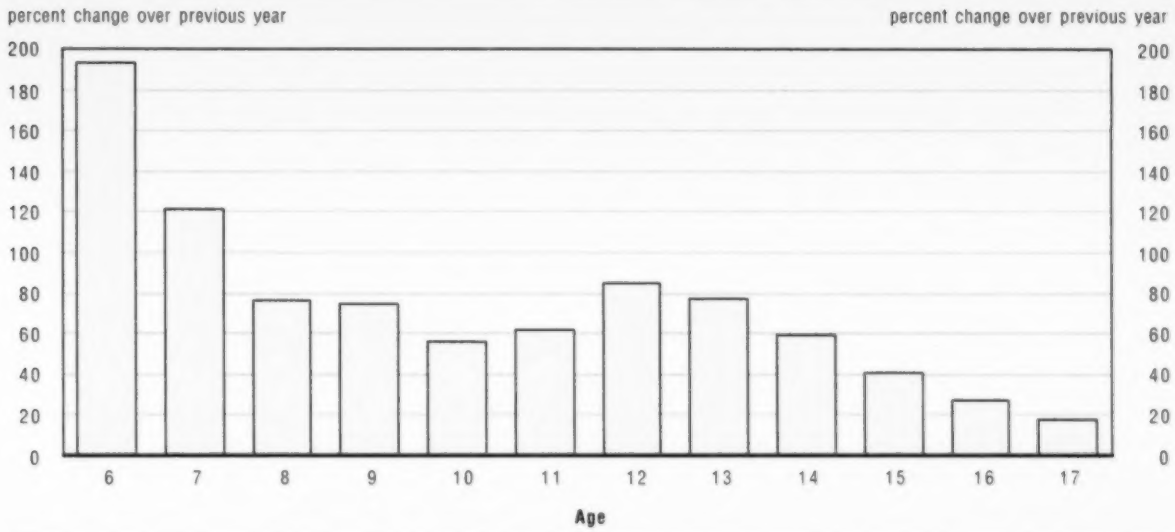


Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

To recapitulate, the proportion of the cohorts ever recorded as offenders rises smoothly with age, reaching 18.5%, or just under one-fifth of cohort members, by the 18th birthday. No levelling-off is evident in Chart 12: if anything, the increases in cumulative prevalence during the teenage years appear to be large and continuing. The largest annual absolute increase in cumulative prevalence takes place at the age of 15, when 3.7% of the cohort commit their first recorded offence.[19] Chart 13 shows the annual rate of increase in cumulative prevalence, relative to the level of the previous year. As in the analysis of the relative rate of change in age-specific prevalence (Chart 4), the largest *relative* increases in cumulative prevalence occur at the youngest ages, and there is a jump at 12 years old which may reflect the under-recording of crime committed by 5 to 11 year olds, due to 12 years old being the minimum age of criminal responsibility. After the age of 12, the relative rate of increase in cumulative prevalence decreases with each year of age: it is 85% at 12 and only 18% at 17. Thus, although large numbers of additional offenders are being added to the cumulative prevalence during the teenage years (Chart 12), the rate at which they are being added is decreasing.

Chart 13

Relative changes by year of age in the cumulative prevalence of recorded delinquency, 6 to 17 years of age



Note: Rates are based on the 1990 birth cohort for 5 to 13 years and the 1987 cohort for 14 to 17 years.

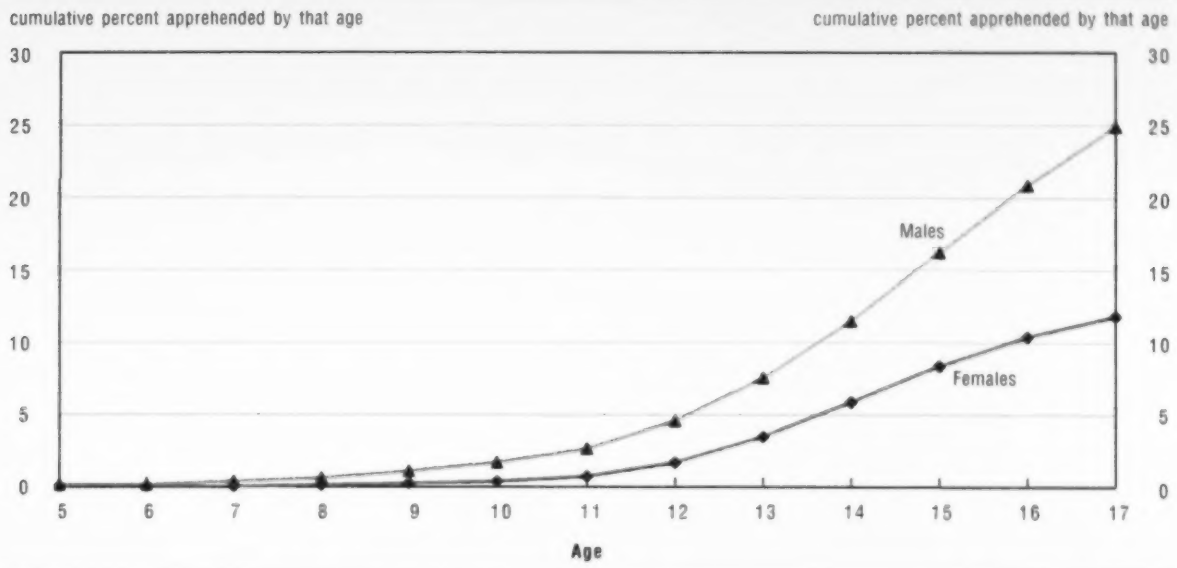
Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Sex and the cumulative prevalence of delinquency

Chart 14 shows the age-related cumulative prevalence of male and female offenders in the cohorts. Of course, male prevalence is higher at all ages, and it has not levelled off by the age of 17,[20] where it reaches a level of 25%, or one in 4 male cohort members. The annual increases in female prevalence appear to be diminishing after 15 years of age: by 17 years of age, 12% of the girls in the 1987 cohort had been identified as offenders. As Chart 15 shows, it is actually female prevalence which increases faster, relative to its level, at all ages up to 15. Even at 17, male and female cumulative prevalence are increasing at rates of 19% and 14%, respectively, of the previous year's rate: nothing like the increases of more than 100% per annum which characterize the early childhood years, but still very substantial.

Chart 14

The cumulative prevalence of recorded delinquency from ages 5 to 17, by sex

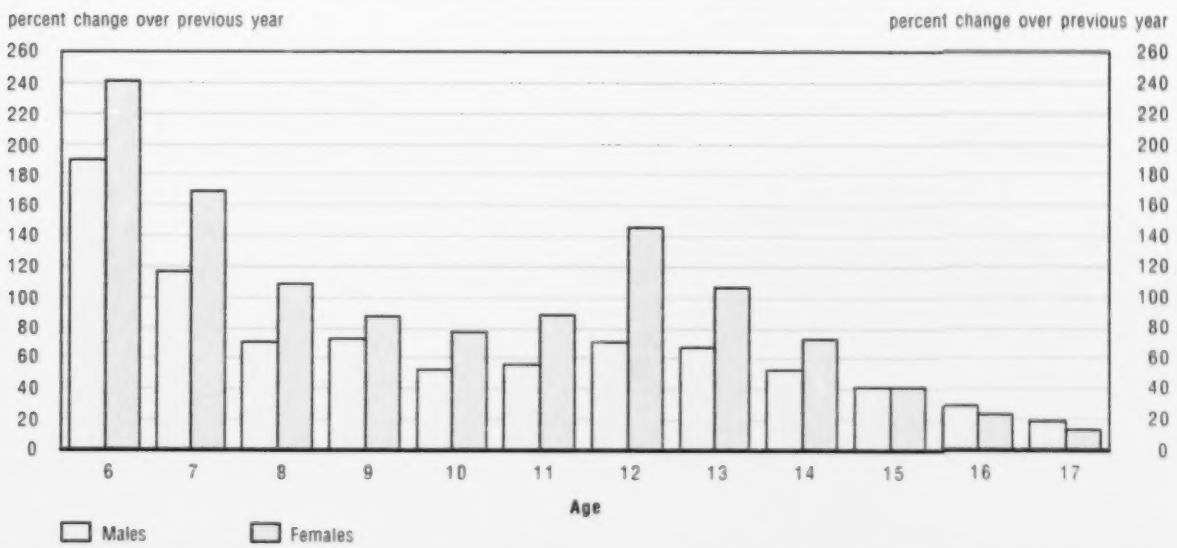


Note: Rates are based on the 1990 birth cohort for 5 to 13 years and the 1987 cohort for 14 to 17 years.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 15

Relative changes in the cumulative prevalence of recorded delinquency from ages 6 to 17, by sex



Note: Rates are based on the 1990 birth cohort for 5 to 13 years and the 1987 cohort for 14 to 17 years.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

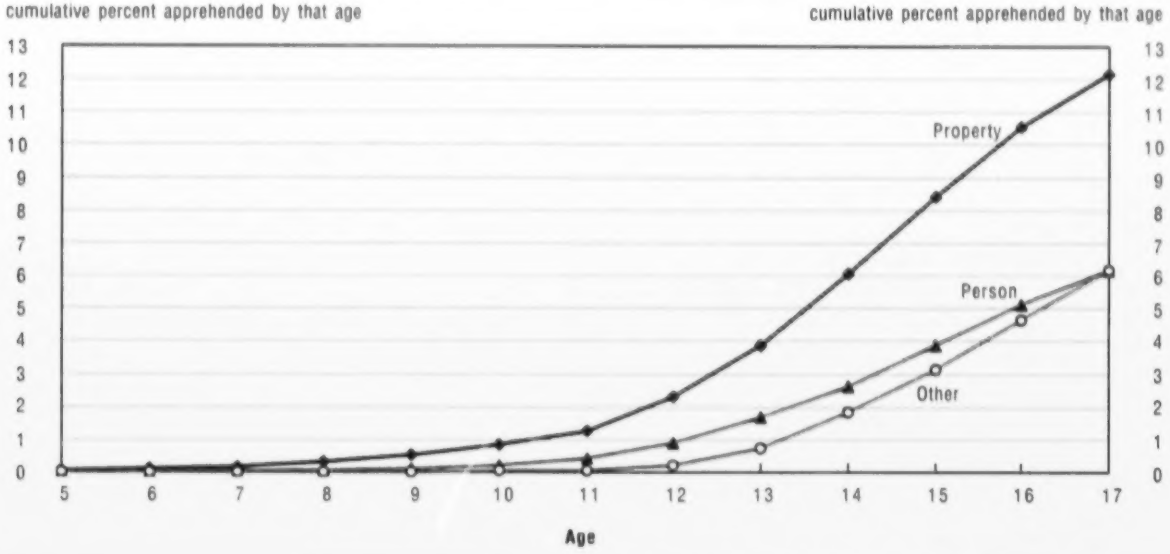
Catalogue no. 85-561-MIE2001009

Cumulative prevalence of different types of offenders

Chart 16 shows the development of the cumulative prevalence of persons apprehended for offences against the person and property, and other offences.[21] The shapes of the curves are similar to the overall cumulative prevalence curve (Chart 12), with property offenders, as usual, being more numerous. By 17 years of age, 6.2% of the 1987 cohort had been apprehended in connection with an offence against the person; 12.2% for a property offence; and 6.2% for an other offence. The trajectories for boys and girls (not shown) are similar to the overall trajectory, except that the cumulative prevalences by the age of 17 are relatively high for male "other" offenders and for female property offenders. By the age of 17, the proportions of boys born in 1987 who had been identified as person, property and other offenders are 9.0%, 15.7%, and 9.7% respectively. In other words, by the age of 17, one in every six boys born in 1987 had been identified as a property offender, one in 11 as an offender against the person, and one in 10 as an "other" offender. For girls, the corresponding proportions are 3.2%, 8.5%, and 2.5%.

Chart 16

The cumulative proportions of recorded offenders, by the age of the offender and the type of most serious offence, 5 to 17 years



Note: Rates are based on the 1990 birth cohort for 5 to 13 years and the 1987 cohort for 14 to 17 years.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Age and the rate of offending

The preceding sections of the report explored the development with age in the two birth cohorts of participation in recorded delinquency. Participation in, or the *prevalence* of, delinquency, was found to increase with age to a peak of 5.8% at 16 years. One in every seventeen persons born in 1987 was identified by police as having committed an offence at the age of 16 (Chart 3).

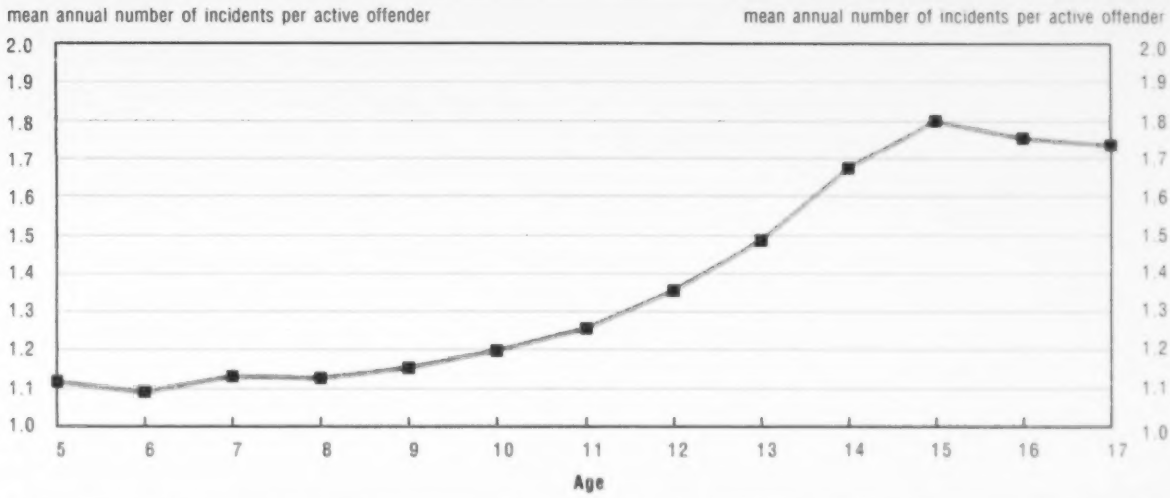
Another aspect of delinquency which varies with age is the number of offences which each offender commits at a given age: that is, the *age-specific rate of offending, or age-specific incidence*. If, on average, teenage offenders commit more crimes per offender per year than children or adults, then the total number of crimes by teenagers will also be higher, even without an increase in the number, or prevalence, of offenders. Thus, the age-specific volume of crime, or *crime rate*, which is the phenomenon charted in the age-crime curve (Chart 1), is the product of age-specific prevalence and age-specific rate of offending, or incidence. This section examines changes with age in the rate of offending.

Chart 17 shows the mean number of recorded incidents per active offender, by year of age.[22] The incidence of recorded offending changes little from 5 to 8 years of age, then increases from an average of 1.1 incidents per 8 year old offender to 1.8 at 15 years. After that age, it begins to decrease. This is true of both boys and girls (Chart 18), although the increase with age is much greater for boys: up to 8 years old, male offenders are implicated in an average of about 1.1 incidents per year, and the incidence for girls fluctuates, but is a little higher. For boys, age-specific incidence then rises by 77% to an average of 1.95 incidents at 15 years old; whereas for girls, it rises by only 22% from 1.18 incidents at 8 years old to 1.44 at 15. Since there are 2 to 4 times as many male as female offenders in this age range (Chart 2), and their increase with age in rate of offending is much greater (Chart 18), it is they who make by far the greatest contribution to the observed overall increase after the age of 8 in age-specific incidence.

Catalogue no. 85-561-MIE2007009

Chart 17

The average rate of offending, or incidence of recorded delinquency from ages 5 to 17

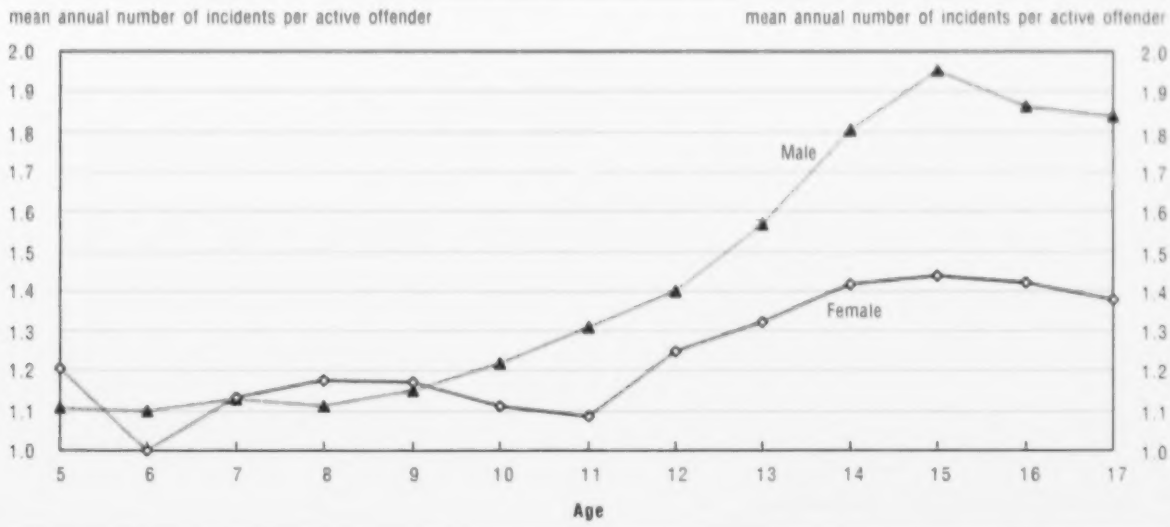


Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 18

The average rate of offending of active offenders from ages 5 to 17, by sex



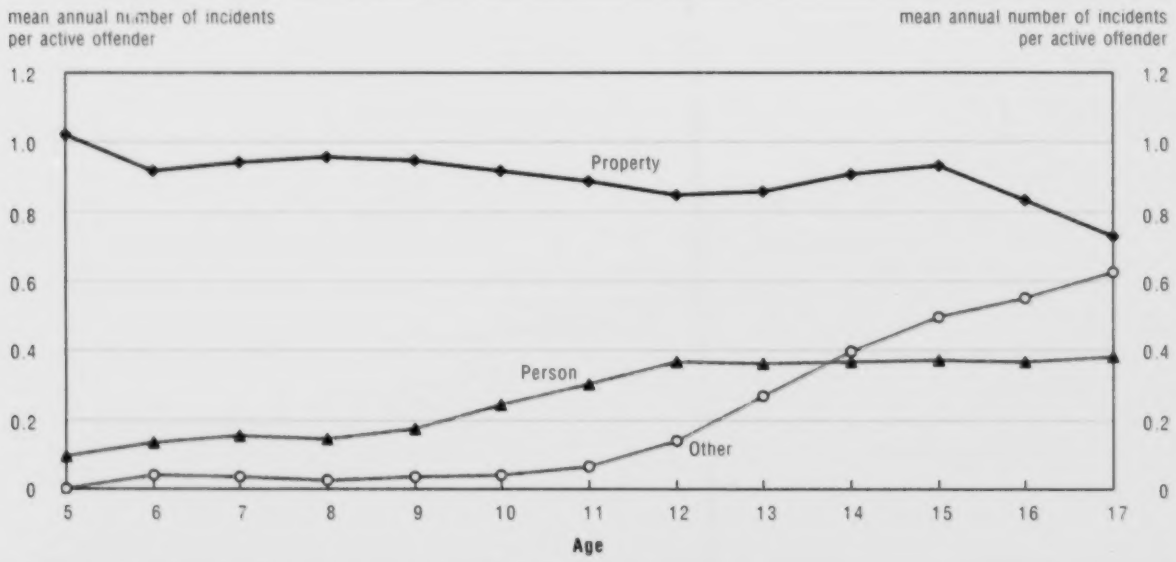
Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 19 shows the mean number of incidents per active offender by year of age, disaggregated into the three types of offences. Only the most serious recorded offence in each incident is considered.[23] There are some very interesting aspects to Chart 19. The rate per offender of property offending is by far the highest, but it does not increase with age like the overall incidence of offending (see Chart 17). However, there is a short-term increase from 12 to 15 years, which contributes to the increase between 12 and 15 in the overall incidence rate. The incidence of offences against the person increases from the age of 5 to 12, after which it becomes almost perfectly constant. The increase with age in the incidence of "other" offences is the most dramatic: it increases by a factor of 10 from 0.06 at 11 years to 0.62 at 17, and has not levelled off by the age of 17, although the rate of increase has decreased slightly. Thus, there are different explanations for the changes in different segments of the age-incidence curve shown in Chart 17. From 8 to 11 years, it is largely (about 80%) due to the increase in the rate of offences against the person. From 11 to 12 years, person and "other" offences each account for about half of the increase in the overall rate of offending. From 12 to 15 years, it is the increase in the rate of "other" offences, from 0.14 to 0.49 per offender, which accounts for most of the increase in overall incidence, with the remainder being due to property offending. The decrease after the age of 15 in the overall rate of offending is entirely due to the rapid decrease in property offending, as the rate of person offending is constant, and that of "other" offending is increasing rapidly.

Chart 19

The average rate of offending from ages 5 to 17, by type of offence



Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

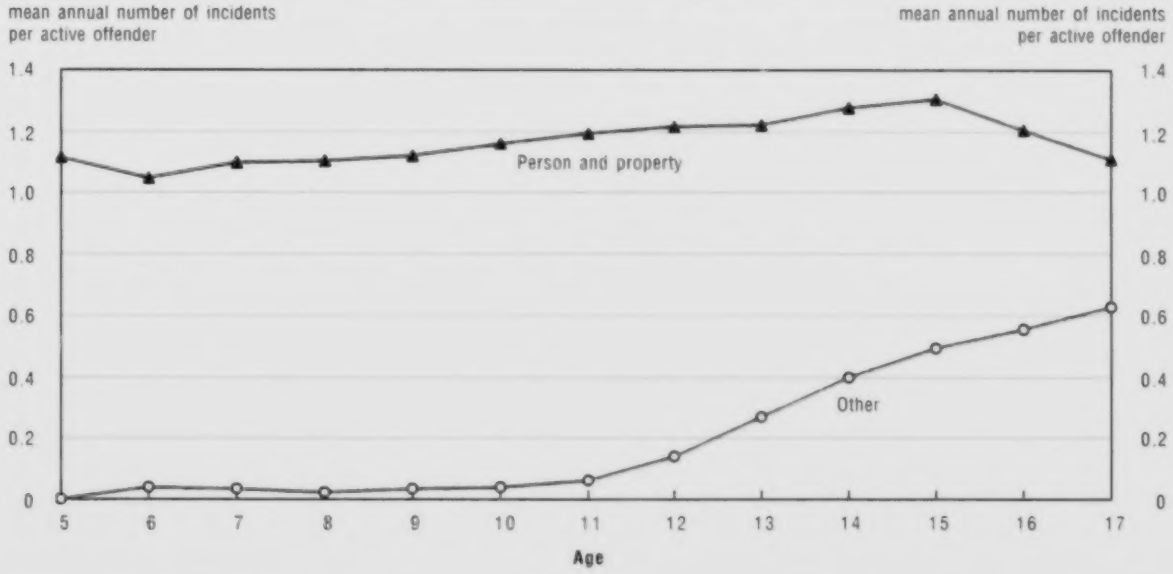
Catalogue no. 85-561-MIE2007009

The importance of "other" offences in the overall increase in incidence after 11 years of age can be seen clearly in Chart 20, in which offences against the person and property are combined. Although the annual average rate of person and property offending increases slowly over the entire age range from 6 to 15 years, and increases by a total of 0.11 incidents from 11 to 15 years, the rate of other offending increases by 0.43 incidents over the same 4 year period – although its base rate is far lower. Chart 21 shows that this proportionately huge increase after 11 years old in the rate of other offending is mainly due to offences against the administration of justice[24] and drug offences, the incidence of both of which increases very steeply.

There are also some interesting differences between boys and girls in the breakdown of incidence by type of offence. The pattern for boys (Chart 22) is, not surprisingly, very similar to the overall pattern (Chart 20). For girls (Chart 23), there is no increase at all with age in the incidence of offences against the person or property: it fluctuates around 1.1 incidents per offender, and decreases slightly after the age of 12. But the incidence of "other" offending rises sharply after 11 years of age, and does not level off or decrease at the end of the age range. Approximately 75% of the increase from 11 to 15 years of age in the rate of "other" offending by girls is due to offences against the administration of justice, with the rest being due to drug offences (Chart 24).

Chart 20

The average rate of offending from ages 5 to 17, by type of offence

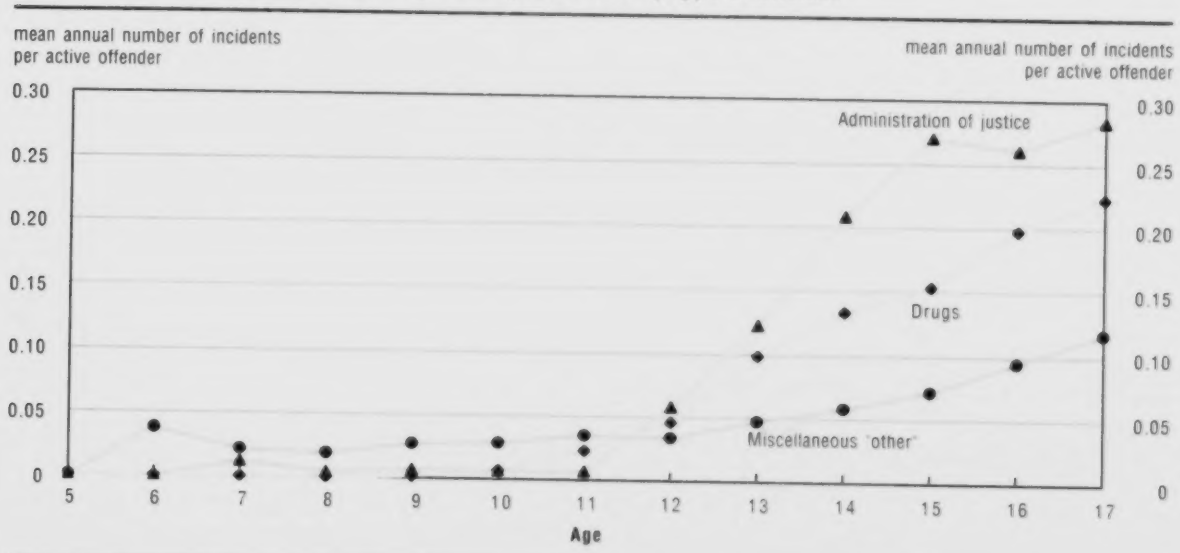


Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 21

The average rate of "other" offending from ages 5 to 17, by type of offence

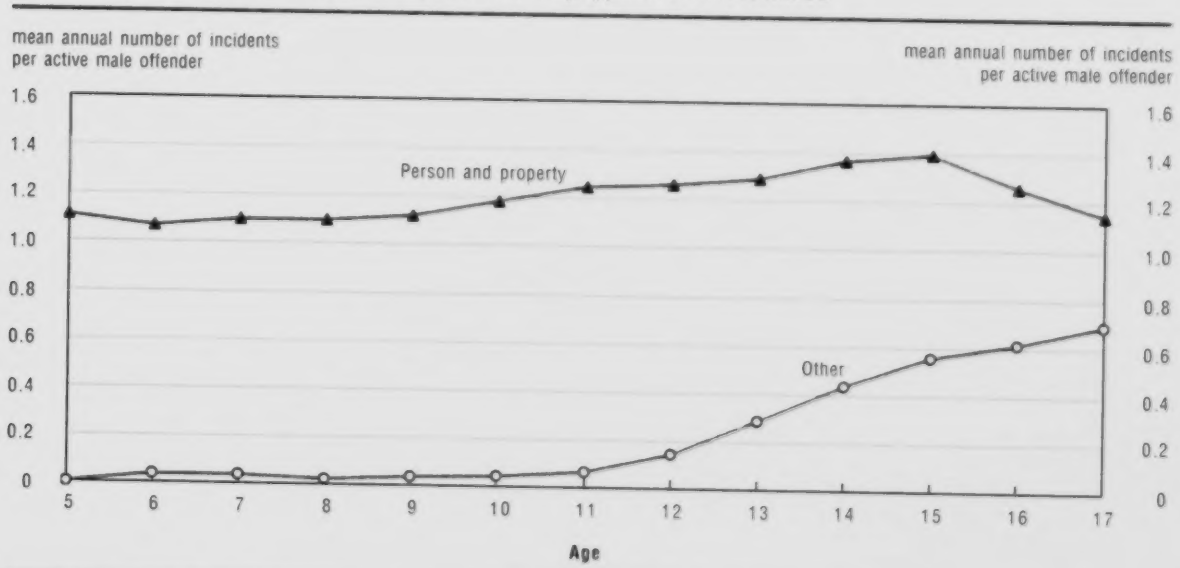


Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 22

The average rate of offending from ages 5 to 17, by type of offence, males

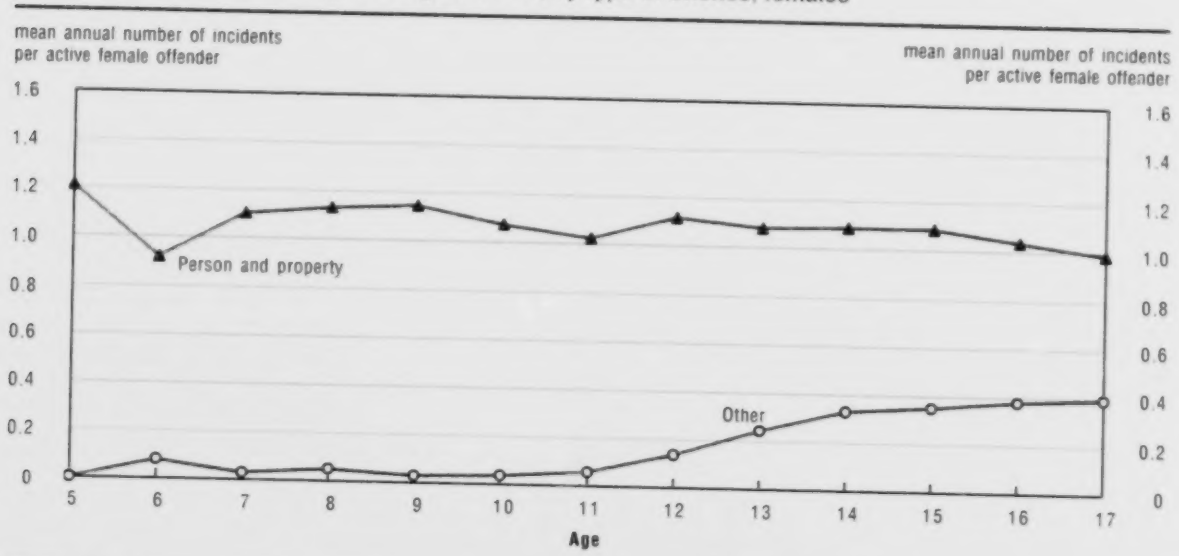


Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 23

The average rate of offending from ages 5 to 17, by type of offence, females

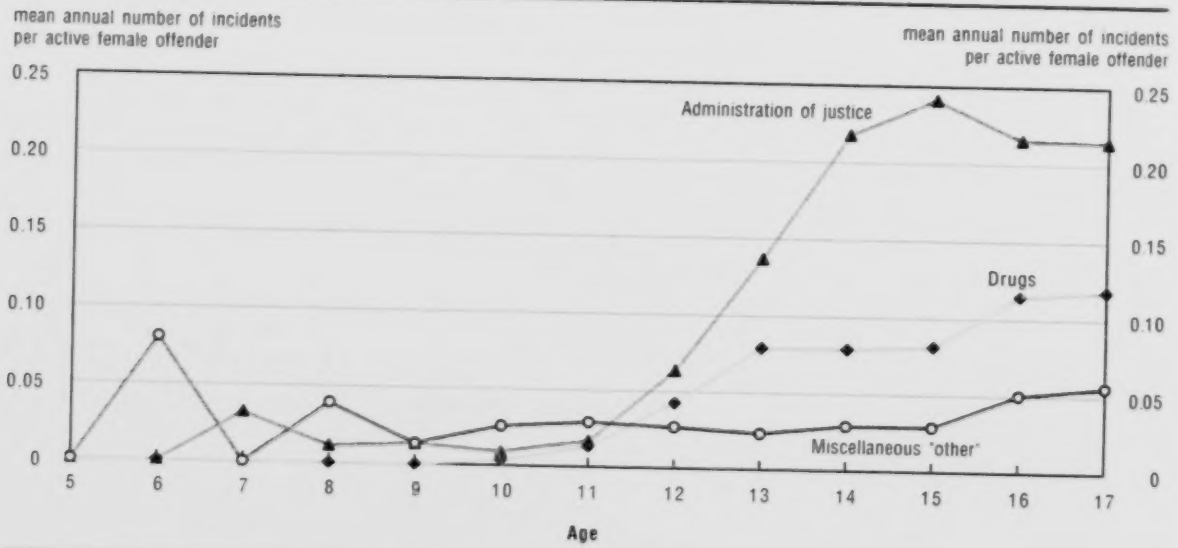


Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 24

The average rate of "other" offending from ages 5 to 17, by type of offence, females only



Note: Rates for ages 8 to 14 are the averages of the rates for the two cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

In summary, the rate, or incidence, of recorded offending fluctuates around 1.1 incidents per active offender per year from 5 to 8 years of age, then increases to a maximum of 1.8 recorded incidents at 15, and decreases thereafter. The increase in incidence is much greater among boys than girls. From 8 to 11 years of age, the overall increase is largely due to an increase in the rate of offences against the person by boys. From 12 to 15 years, the increase is largely due to an increase in the rate of administrative and drug offences by both sexes, although boys play a larger role.

The onset of the delinquent career

The *age of onset* of a delinquent or criminal career refers, in principle, to the age at which the person first commits a delinquent or criminal act. Where, as in the present study, data are available for childhood offending, the notion of a "delinquent or criminal act" is problematic – both because of the legal doctrine of *doli incapax*,[25] and because most if not all criminal law regimes have a minimum age of criminal responsibility: in Canada, since 1984, it has been the 12th birthday. Thus, the "age of onset" in this study refers to the age at which a person is first recorded as being involved in an incident in connection with which he or she was chargeable with a criminal offence, or would have been chargeable if he or she had been at least 12 years old. As mentioned previously, it is possible that the public under-reports crime by children, and that the police under-record apprehended offenders younger than 12 years old because they cannot be charged. Therefore, in this study, offenders with an age of onset under 12 may be under-represented. Of course, the reliance of this study on police data means that early offending which is not known to the police is not captured: thus, the age of onset is that of the police-recorded delinquent career, not necessarily the "actual" delinquent career.

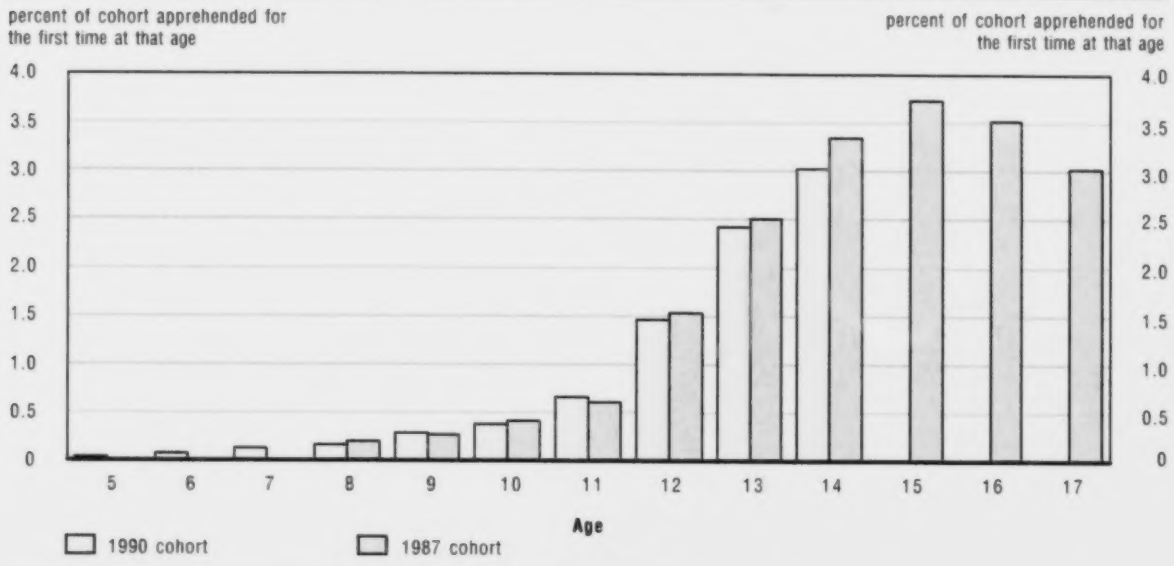
The age of onset is interesting in itself, but it has also been found to be correlated with many other aspects of the delinquent or criminal career. Indeed, the distinction between the characteristics of "early onset" and "late onset" careers and offenders is one of the most firmly established in the literature.[26]

Chart 25 shows the ages of onset of offenders in each cohort. Very small numbers in both cohorts are recorded early onset offenders: less than 0.5% of each cohort commit their first recorded offence at each year of age before 11, and less than 1% at 11. Many more offenders begin their delinquent careers at 12 years or older: 1.5% of the 1990 cohort at 12 years, 2.5% at 13, and so on, with a peak of 3.7% of the 1987 cohort beginning their delinquent careers at the age of 15. After 15, the numbers of new offenders begin to decrease.

Catalogue no. 85-561-MIE2007009

Chart 25

The age of onset of recorded delinquency, 5 to 17 years old



Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

Recorded proportions of the 1987 cohort with ages of onset of 8, 10, and 12 to 14 are higher than in the cohort born in 1990.[27] The reason for this is that there are no data about offending prior to 1995, and therefore no data on onset prior to their 8th birthdays of members of the cohort born in 1987. Thus, some members of the 1987 cohort are recorded as beginning their careers at ages 8 to 14 (and older), who actually committed their first chargeable offence at 5 to 7 years of age.[28] In view of this slight inaccuracy in age of onset statistics for the 1987 cohort, the approach used in the following analyses of age of onset (as in the analyses of cumulative prevalence of offending, above) is to combine the cohorts by reporting proportions of the cohort born in 1990 for the ages of 5 to 13, and of the 1987 cohort thereafter.

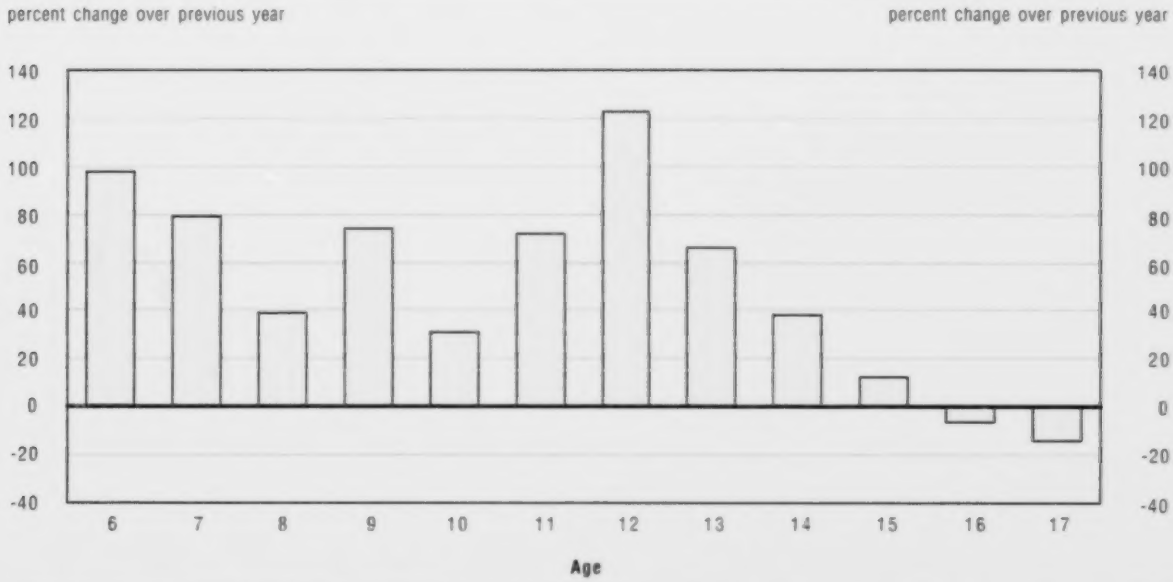
To recapitulate, the recorded onset of offending is very low during childhood and rises rapidly during the teenage years. Although "early onset" is a key concept in criminal careers research, it has no agreed-upon definition. If early onset is defined as occurring before the minimum age of criminal responsibility in Canada - the 12th birthday – then only 1.7% of the 1990 cohort, or 11% of recorded offenders in both cohorts, were early onset offenders.[29]

Chart 26 shows the changes with age, relative to the level at the previous year of age, in the proportion of the combined cohorts committing their first recorded offence.[30] Although the proportions increase with every year of age up to 15 (Chart 25), the relative change with age (Chart 26) shows no such pattern. Apart from the possible undercounting for all ages prior to the minimum age of criminal responsibility, which is reflected in the chart by a large increase at the age of 12, the change from year to year in the proportions of the cohorts who committed their first recorded offence fluctuates between the ages of 6 and 11, then decreases rapidly

from 12 to 17 years. Relative onset becomes negative at 16 years of age – that is, the number of cohort members whose recorded careers begin after the age of 15 becomes smaller instead of larger with each year of age (cf. Figure 25).

Chart 26

Relative changes by year of age in the proportion of the cohort who committed their first recorded offence, 6 to 17 years of age



Note: Rates are based on the 1990 birth cohort for 5 to 13 years and the 1987 cohort for 14 to 17 years.

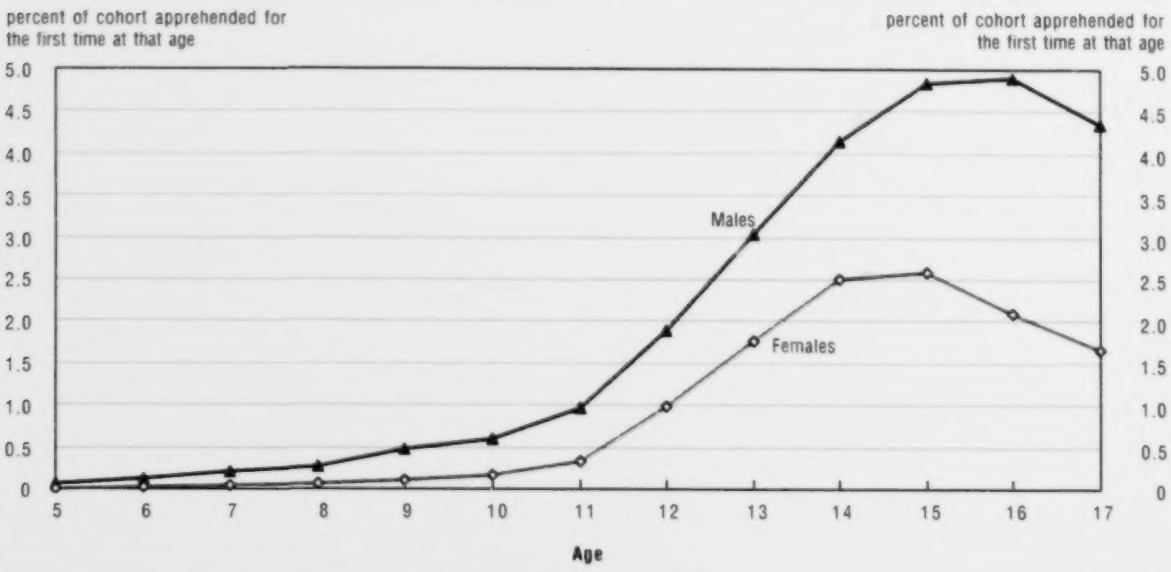
Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Sex and the age of onset

Chart 27 shows the distribution of ages of onset, disaggregated by sex. The curves are similar to the overall curve (Chart 25), except that onset peaks for boys at 16 years of age, at 4.9% of the male population of the cohort, and for girls at 15, at 2.6%. Defining early onset as occurring before the 12th birthday, 2.6% of male cohort members, or 13% of recorded male offenders were early onset; the figures for girls are 0.7% of cohort members and 7% of recorded offenders.[31]

Chart 27

The age of onset of recorded delinquency from ages 5 to 17, by sex



Note: Rates are based on the 1990 birth cohort for 5 to 13 years and the 1987 cohort for 14 to 17 years.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

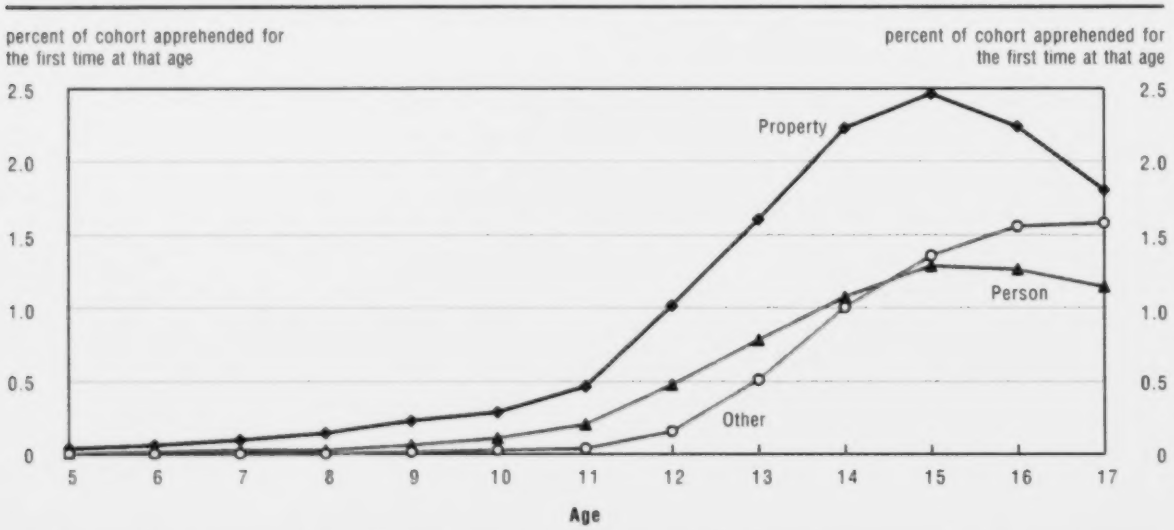
Onset and the type of offence

Chart 28 shows the distribution of ages of onset for each type of offence: that is, the age at which an alleged offender was first apprehended for a particular type of offence.[32] The three age-of-onset curves are similar to the overall curve (Chart 25), except that onset for "other" offences remains very low before the 12th birthday, then increases rapidly, surpassing the rate for offences against the person at 15 years of age, and continuing to rise to the end of the period of the study. Onset for the other two types of offence peaks at 15 years of age.

The rate of onset of each type of offence is rather different for girls than for boys (Charts 29 and 30). The increase with age in the proportion of girls committing their first recorded property offence is much greater in the early teenage years than that of offences against the person or other offences. Although it decreases after the age of 15, the proportions of girls committing their first recorded property offence at 16 and 17 years are still more than twice as high as the proportions committing their first offence against the person or other offences. The pattern for boys is similar to that for the combined sexes (Chart 28), except that the proportion of boys committing their first recorded "other" offence at 17 years of age is greater than the proportions committing their first property or person offences.

Chart 28

The age of onset of recorded delinquency from ages 5 to 17, by type of offence

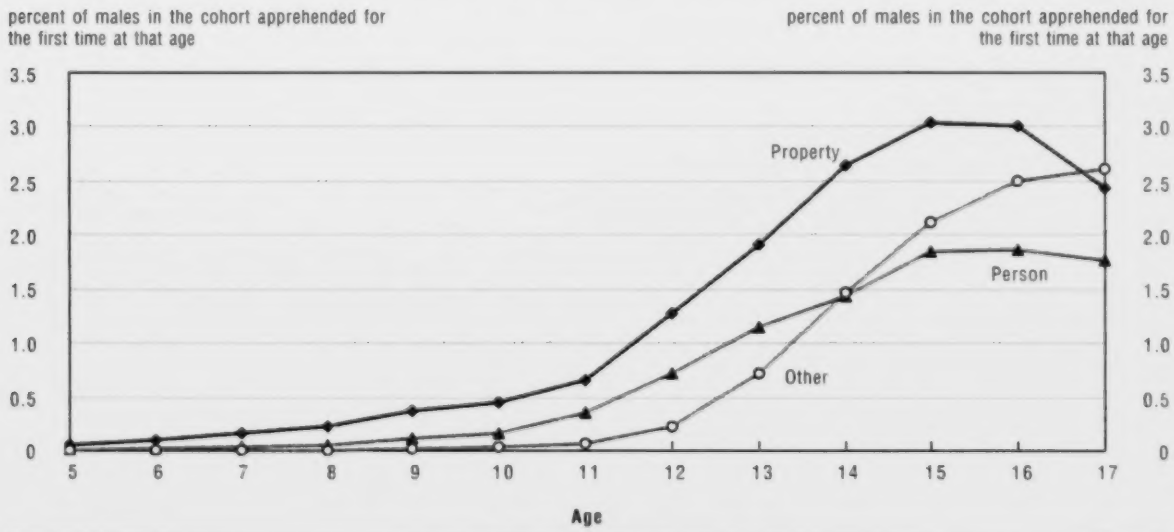


Note: Rates are based on the 1990 birth cohort for 5 to 13 years and the 1987 cohort for 14 to 17 years.

Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

Chart 29

The age of onset of recorded delinquency from ages 5 to 17, by type of offence, males only



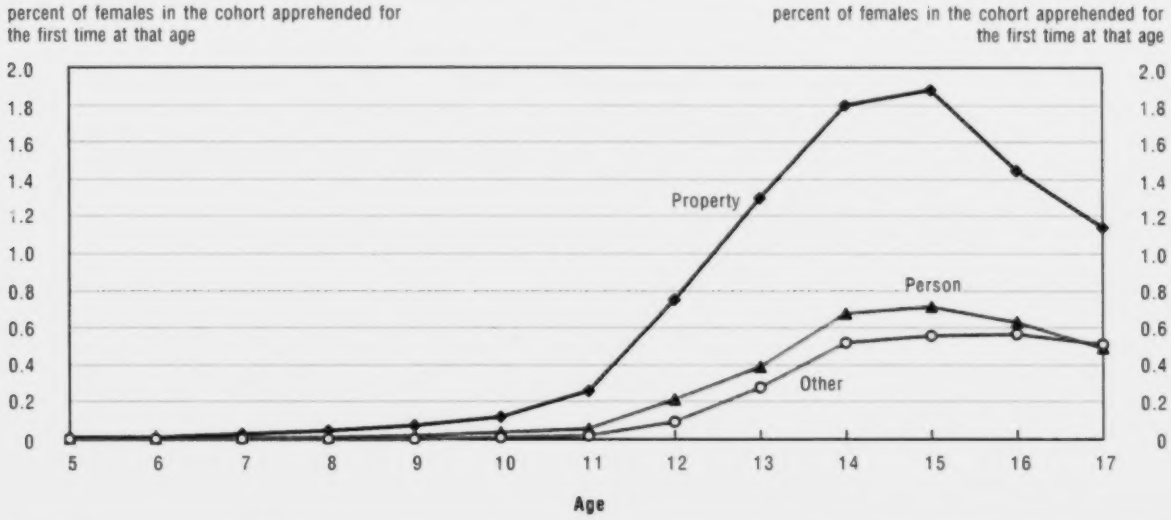
Note: Rates are based on the 1990 birth cohort for 5 to 13 years and the 1987 cohort for 14 to 17 years.

Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

Catalogue no. 85-561-MIE2007009

Chart 30

The age of onset of recorded delinquency from ages 5 to 17, by type of offence, females only



Note: Rates are based on the 1990 birth cohort for 5 to 13 years and the 1987 cohort for 14 to 17 years.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

The duration of the delinquent career

The duration of a delinquent or criminal career is the length of time between the first and last incidents in the career. The date of the last incident – the "termination" of the career, or "desistance" from crime – is difficult or impossible to determine without tracking the subject to his or her death. This is usually not possible, although it has been done (Laub & Sampson, 2003). Various methods have been used to circumvent this problem (Kazemian, 2007). One approach is to define the date of desistance simply as the date of the last recorded incident during the period of observation (Farrington & Wikström, 1994). The problem with this approach is, of course, that it causes a downward bias in the estimate of career duration, since the durations of careers which continue past the end of the period of observation are underestimated. Another approach is to confine the analysis of the duration of careers to those which appear to be terminated. This raises the question of how long an offender must be inactive to be considered to have desisted. Various periods of qualifying inactivity have been used as indicators of desistance, ranging from 1 year to 5 years (Kyvsgaard, 2003). Obviously, the longer the period required as evidence of desistance, the less likely one is to misidentify a career as terminated. However, given a fixed and limited period of observation, the longer the period of inactivity which is required as evidence of desistance, the shorter the remaining period of activity which is available for analysis. For example, if the period of observation is 10 years, and 5 years of inactivity is required as evidence of desistance, then the longest possible career is only 5 years. Thus, the choice of the indicative period of inactivity represents a trade-off.

In the present study, the period of observation is 10 years: the data are truncated at the 18th birthday for the cohort born in 1987 and at the 15th birthday for those born in 1990. Some guidance as to a reasonable criterion period of inactivity was available from an analysis of the distribution of amounts of time which elapsed between all pairs of adjacent recorded incidents in all repeat offenders' careers. Ninety-three percent of these intervals were of less than 2 years.[33] Therefore, a career was defined as terminated, or completed, if there were no incidents during the last 2 years of observation. The result is that completed careers have a maximum length of 8 years less a day: from the 5th birthday to the day before the 13th birthday for the cohort born in 1990, and from the 8th to a day before the 16th birthday for the 1987 birth cohort. Careers with an incident during the last 2 years of observation were treated as possibly continuing, and therefore of unknown duration, and omitted from the analyses of duration.

Another issue which arises in the analysis of career duration is the treatment of offenders with only one recorded incident, who constitute the majority, or at least the modal category of offender, in most criminal career research using samples from the general population (versus populations of high-risk subjects). Some researchers omit these offenders from analyses of career duration, on the grounds that the concept of "duration" (and even perhaps of "career") does not apply to one-time offenders. Others include one-time offenders, assigning their careers a duration of 0 (e.g. Kyvsgaard, 2003). The latter approach is used in this study, on the grounds that this is numerically a very important group, making up 69% of offenders in the two cohorts. However, one-time and repeat offenders are distinguished in the analyses, so that one-time offenders do not skew the duration estimates.

The distinctions discussed above result in a threefold classification of offenders and their careers for the purpose of analysing career duration:

- One-time offenders with apparently completed careers (i.e. no recorded incidents in the last 2 years of observation), and therefore a duration of 0;
- Repeat offenders with apparently completed careers (i.e. no recorded incidents in the last 2 years of observation); and
- One-time and repeat offenders whose careers may not be complete, because they have recorded incidents in the last 2 years of observation, and whose career duration is therefore unknown.

The distribution of offenders into these three categories, by birth cohort and by sex, is shown in Table 2.

Catalogue no. 85-561-MIE2007009

Table 2

Classification of the duration of delinquent careers, by cohort and by sex

Career type	Both sexes		Both cohorts		
	1990 cohort	1987 cohort	Male	Female	Both cohorts and sexes
			percent		
One-time completed	23.0	36.5	29.1	38.7	32.1
Repeater completed	3.4	11.2	9.0	7.9	8.7
Possibly continuing	73.6	52.3	61.9	53.4	59.2
Total percent	100.0	100.0	100.0	100.0	100.0
Total number	18,190	38,009	38,355	17,845	56,199

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Forty-one percent of offenders began and apparently ended their careers of recorded crime at least 2 years before the end of the observation period: 26% of offenders born in 1990, desisting before their 13th birthdays, and 48% of those born in 1987, desisting before their 16th birthdays. About four-fifths of these desisters have only one recorded incident in their careers. The lower proportion of completed careers in the younger cohort reflects the fact that a greater proportion of that cohort began offending in the last 2 years of observation (i.e. aged 13 or 14 years), and are therefore by definition incapable of having completed careers. The distributions do not differ greatly by the sex of the offender, although girls are more likely than boys to have completed careers, especially completed careers comprising only one recorded incident.

Most of the offenders in these two birth cohorts had rather short delinquent careers. Excluding the offenders whose careers continued into the last 2 years of the observation period, and therefore may continue into the future, the mean length of offenders' careers was 0.26 years, or 3 months (Table 3). Over 80% of these offenders had a career that lasted only 1 day, either because the offender was involved in only 1 incident, or because all his or her incidents occurred on the same day.[34] Over 90% had careers lasting 1 year or less. Only 5% of these offenders with completed careers had careers lasting more than 2 years.[35]

Table 3
The duration of completed delinquent careers

Career length	Completed 1-time and repeaters	Completed repeaters
	percent	
1 day	81.2	11.7
More than 1 day to 6 months	6.4	30.4
More than 6 months to 1 year	3.1	14.7
More than 1 year to 2 years	4.4	20.7
More than 2 years	4.8	22.5
Total percent	100.0	100.0
Total number	22,922	4,869
Mean duration (years)	0.26	1.23
Mean duration (days)	94	448

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

The duration of the career and the age of onset

It has repeatedly been found that an early age of onset is associated with a longer (and more serious) criminal career. However, this association has been found to be weaker or nonexistent when only the *delinquent* career is examined (Kazemian & Farrington, 2006). Table 4 shows the relationship between the offender's age of onset and the likelihood of having a career which is completed during the period of observation (i.e. has no incidents in the last 2 years of observation). This table clearly shows that the reason why the overall proportions of completed careers are low is the large number of offenders whose first offence occurred during the last 2 years of the observation period. When these offenders are omitted from the calculations (Table 4, section b) the overall proportion of completed careers increases substantially from 41% to 73%.

Table 4 also shows that there is no association between the age of onset and the likelihood of having a career which is terminated during the period of observation. When the probability of the latter is regressed on age of onset separately for offenders in each birth cohort, and for all offenders together, the coefficients are small and non-significant, and in different directions. Thus, these data provide no evidence that offenders with earlier ages of onset are more likely to have careers which continue from childhood into adolescence (for the 1990 cohort), or from adolescence into adulthood (for the 1987 birth cohort). However, the fact that early onset offenders are as likely as late onset offenders to have careers which persist beyond the year 2003 suggests that early onset offenders have, on average, longer careers; and that, in general, career length is negatively associated with age of onset.

Catalogue no. 85-561-MIE2007009

Table 4

Completion of delinquent careers by the age of onset

	1990 cohort[1]	1987 cohort[1]	Both cohorts[1]
(a) All offenders		percent completed	
Age of onset			
5	75.0	...	75.0
6	75.6	...	75.6
7	78.3	...	78.3
8	71.6	72.6	72.1
9	74.0	76.3	75.1
10	73.9	70.2	72.0
11	74.2	70.6	72.5
12	71.6	72.9	72.2
13	0.0	74.1	36.1
14	0.0	75.0	37.7
15	...	72.7	72.7
16	...	0.0	0.0
17	...	0.0	0.0
Total percent	26.4	47.7	40.6
Total number	18,190	38,009	56,199
(b) Offenders with onset before 2004			
Percent with completed careers[2]	73.0	73.5	72.7
Total number with onset before 2004	6,577	24,654	19,793
(c) Linear regression of percent with completed careers on age of onset (offenders with onset before 2004)			
Unstandardized b	-0.006	0.001	0.0002
T ratio	-1.89	0.57	0.15
P(b=0)	0.06	0.57	0.88

... not applicable

1. Percentages for the last 2 years of age of onset are 0 by definition.

2 The calculation of the percent with completed careers omits persons born in 1990 with ages of onset of 13 or 14 years and persons born in 1987 with ages of onset of 16 or 17 years.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

In summary, the available data suggest that the likelihood of a childhood-onset delinquent career continuing into adolescence, or of an adolescent-onset delinquent career continuing into later adolescence and possibly into adulthood, is unrelated to the age of onset. Given the truncation of the period of observation at 10 years, this means that the observed duration of the career is negatively related to the age of onset: early onset careers tend to be longer than late onset careers during the 10-year period of observation.

The amount of delinquent activity

The number of recorded criminal incidents in a delinquent career is an indicator of the overall extent of the offender's delinquent activity. Most offenders in both birth cohorts were involved in only one recorded incident during the 10 year observation period. A minority had very active careers. On average, offenders born in 1987 were implicated in 2.4 recorded incidents between their 8th and 18th birthdays. These included an average of 2.1 incidents involving at least one substantive offence and 0.3 incidents involving only alleged offences against the administration of justice[36]. Average career activity was somewhat less for the 1990 cohort: an overall average of 1.7 incidents between the 5th and 15th birthdays, of which 1.6 were substantive incidents. This reflects both the less intense recorded criminal activity characteristic of younger children, and the virtual absence of offences against the administration of justice before the age of criminal responsibility is reached at the 12th birthday: since children under 12 cannot be charged with, or found guilty of, criminal offences, they are not at risk of committing the common administrative offences of violation of bail or probation conditions, or failure to appear for court.

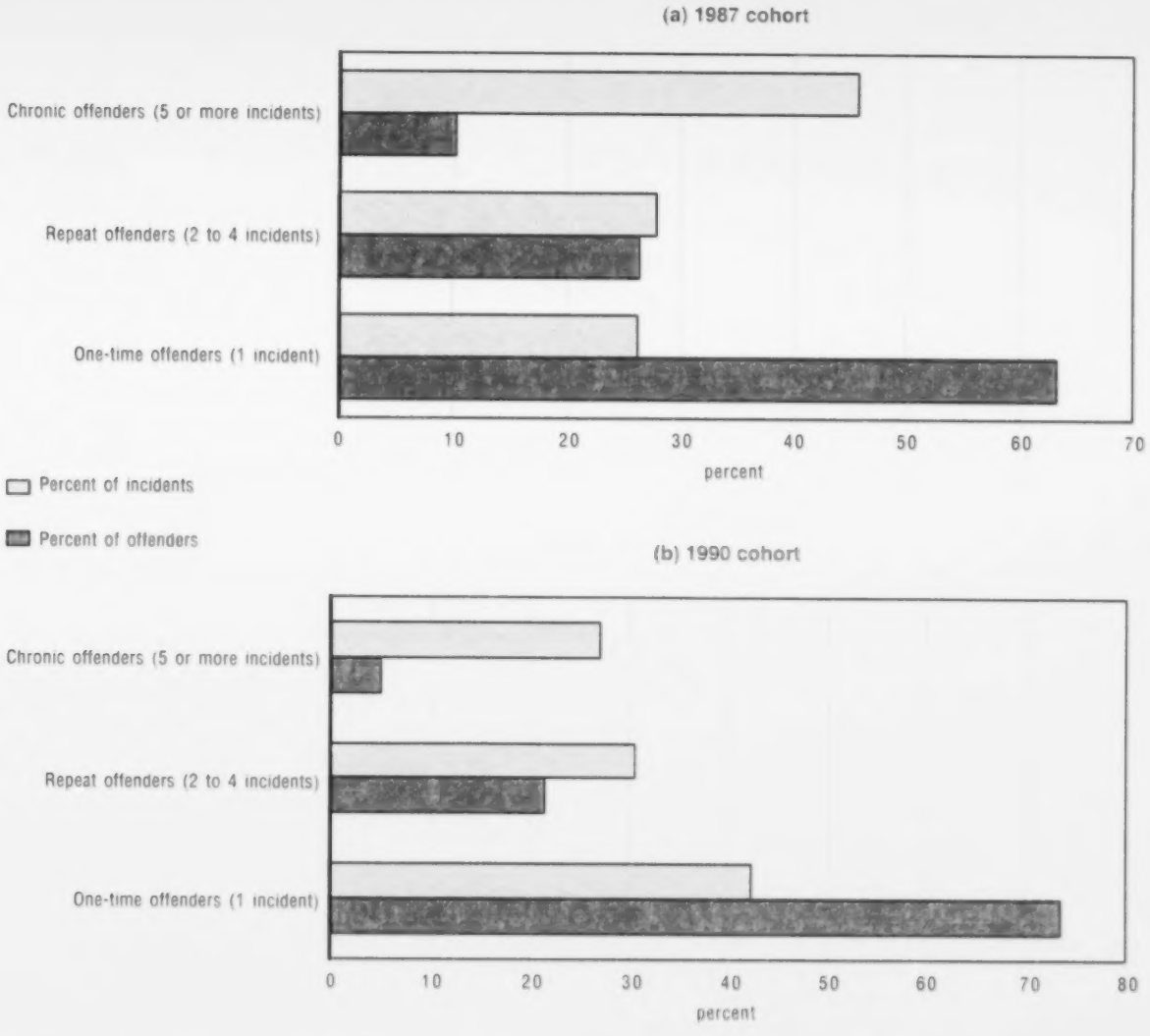
One of the most striking findings of research on delinquent and criminal careers is the uneven distribution of criminal activity among offenders. This was first documented in the classic study by Wolfgang et al. (1972) of boys in Philadelphia, which found that a small number of very active offenders were responsible for the majority of recorded crime committed by members of the birth cohort: 52% of the recorded crimes were committed by the 18% of offenders who committed five or more recorded offences, and were termed "chronic" offenders in the study. Those chronic offenders averaged 8.5 recorded offences between their 7th and 18th birthdays. On the other hand, almost half the offenders in the birth cohort (46%) committed only one recorded offence during the period of observation. This result has been replicated in many different studies. For example, in their study of the "court careers"[37] from the 12th to the 22nd birthday of Canadians born in 1979/80, Carrington et al. (2005) found that 16% of the offenders who had five or more incidents in their court careers were responsible for 58% of all incidents, and that 55% of the offenders had only one incident in their court career.

Chart 31 and Table 5 show the breakdown of offenders and their activity in the 1990 and 1987 birth cohorts, using the same classification scheme as Wolfgang et al. The uneven distribution is evident in both cohorts. Chronic offenders make up only 10% of offenders born in 1987, but they account for 46% of recorded incidents involving members of that cohort; they averaged 10.8 incidents per offender. On the other hand, 63% of offenders born in 1987 had only one recorded incident in their delinquent careers.[38]

Catalogue no. 85-561-MIE2007009

Chart 31

The uneven distribution of recorded delinquent activity among offenders



Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Table 5

The uneven distribution of recorded delinquent activity among offenders

	1987 cohort			1990 cohort		
	Mean number of incidents	Percent of incidents	Percent of offenders	Mean number of incidents	Percent of incidents	Percent of offenders
All incidents						
One-time offenders (1 incident)	1.00	26.3	63.4	1.00	42.3	73.5
Repeat offenders (2 to 4 incidents)	2.55	27.9	26.4	2.48	30.6	21.5
Chronic offenders (5 or more incidents)	10.76	45.8	10.2	9.27	27.1	5.1
All offenders	2.41	100.0	100.0	1.74	100.0	100.0
Total number	...	91,491	38,009	...	31,588	18,190
Standard deviation (weighted)	4.47	...	...	2.51	...	...
Gini index (unweighted)	0.49	...	...	0.37	...	...
Substantive incidents						
One-time offenders (1 incident)	1.00	30.6	63.9	1.00	45.4	73.5
Repeat offenders (2 to 4 incidents)	2.40	31.8	27.7	2.39	32.8	22.3
Chronic offenders (5 or more incidents)	9.34	37.6	8.4	8.25	21.7	4.3
All offenders	2.09	100.0	100.0	1.62	100.0	100.0
Total number	...	79,436	38,009	...	29,424	18,181
Standard deviation (weighted)	3.50	...	...	2.02	...	...
Gini index (unweighted)	0.45	...	...	0.34	...	...

... not applicable

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

The three categories of offenders in Wolfgang's typology give only a crude picture of the inequality of recorded delinquent activity. The Gini coefficient is a more precise indicator of inequality which is based on the entire distribution of criminal activity. This index is commonly used to measure inequality of the distribution of wealth or income in a population, and ranges from 0 (for a perfectly equal distribution) to 1 (for a perfectly unequal distribution). The values of the Gini coefficient for the number of recorded incidents in the careers of members of the 1987 and 1990 cohorts are 0.49 and 0.37 respectively (Table 5), confirming the greater inequality of activity in the 1987 cohort.[39]

The inequality of criminal activity decreases slightly if attention is restricted to substantive incidents – that is, if incidents which involve only administrative offences are excluded. The proportions of chronic offenders born in 1987 and 1990 decrease from 10% and 5% to 8% and 4% respectively, and the values of the Gini coefficient and standard deviation are also slightly lower (Table 5).

Table 6 shows the total recorded frequency of offending broken down by sex. Male offenders were more active than females, having an average of 2.7 recorded incidents in their careers, versus 1.8 for girls, in the 1987 cohort. Similar differences exist in the 1990 cohort. The more intense delinquent activity of boys is expressed more in a higher proportion (13%) of male than female (5%) chronic offenders, in the 1987 birth cohort, than in the average level of activity of those chronic offenders, which is not strongly differentiated by sex –11.0 incidents for male chronic offenders and 9.4 for females. Chronic offenders were responsible for half (51%) of all recorded incidents involving boys born in 1987, compared to only 27% for girls. The comparative results are similar in the 1990 cohort. The greater differentiation, or inequality, of activity among boys is also indicated by the Gini coefficients: for

boys in the 1987 cohort, it is 0.52, for girls it is 0.38. The results for boys can be compared with those reported for boys in Philadelphia, some 30 or 40 years earlier, by Wolfgang et al. (1972). Wolfgang et al. found that the 18% of chronic (male) offenders averaged 8.5 recorded offences and were responsible for 52% of the cohort's recorded crime; the present study found that the 13% of chronic male offenders born in 1987 averaged 11 recorded offences, and were responsible for 51% of the cohort's recorded crimes. One-time offenders made up 46% of the offenders in the Wolfgang study, and 59% of male offenders in the present study.

Table 6

The uneven distribution of recorded delinquent activity among offenders, by sex

	1987 cohort			1990 cohort		
	Mean number of incidents	Percent of incidents	Percent of offenders	Mean number of incidents	Percent of incidents	Percent of offenders
All incidents – males						
One-time offenders (1 incident)	1.00	21.6	58.5	1.00	37.2	69.6
Repeat offenders (2 to 4 incidents)	2.57	27.6	29.0	2.49	32.4	24.3
Chronic offenders (5 or more incidents)	11.03	50.8	12.5	9.35	30.4	6.1
All offenders	2.71	100.0	100.0	1.87	100.0	100.0
Total number	...	70,743	26,120	...	22,894	12,235
Standard deviation (weighted)	5.07	...	...	2.82	...	...
Gini index (unweighted)	0.52	...	...	0.40	...	...
Substantive incidents – males						
One-time offenders (1 incident)	1.00	25.0	59.0	1.00	39.7	69.6
Repeat offenders (2 to 4 incidents)	2.45	31.4	30.3	2.42	34.8	25.2
Chronic offenders (5 or more incidents)	9.65	43.6	10.7	8.47	25.5	5.3
All offenders	2.36	100.0	100.0	1.75	100.0	100.0
Total number	...	61,652	26,120	...	21,429	12,235
Standard deviation (weighted)	4.07	...	...	2.31	...	...
Gini index (unweighted)	0.48	...	...	0.37	...	...
All incidents – females						
One-time offenders (1 incident)	1.00	45.1	76.0	1.00	61.9	84.3
Repeat offenders (2 to 4 incidents)	2.46	28.1	19.2	2.43	23.6	13.4
Chronic offenders (5 or more incidents)	9.35	26.8	4.8	8.92	14.4	2.2
All offenders	1.75	100.0	100.0	1.46	100.0	100.0
Total number	...	20,748	11,889	...	8,694	5,956
Standard deviation (weighted)	2.62	...	...	1.70	...	...
Gini index (unweighted)	0.38	...	...	0.29	...	...
Substantive incidents – females						
One-time offenders (1 incident)	1.00	53.0	76.6	1.00	65.8	84.1
Repeat offenders (2 to 4 incidents)	2.27	32.3	20.5	2.28	24.8	14.2
Chronic offenders (5 or more incidents)	7.24	14.7	2.9	7.18	9.4	1.7
All offenders	1.50	100.0	100.0	1.34	100.0	100.0
Total number	...	17,784	11,889	...	7,995	5,956
Standard deviation (weighted)	1.55	...	...	1.18	...	...
Gini index (unweighted)	0.31	...	...	0.24	...	...

... not applicable

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Delinquent activity and age of onset

One of the common findings of criminal careers research is that children who begin early to engage in antisocial behaviour and delinquency are more likely to become chronic and serious offenders. This implies that these "early onset" offenders would have longer careers incorporating more criminal activity (Farrington, 1986; 1992; Farrington et al., 2003; Piquero et al., 2007). The section on the duration of delinquent careers (above) established that the early onset offenders in these two cohorts do have longer delinquent careers, within the limits of the period of observation.

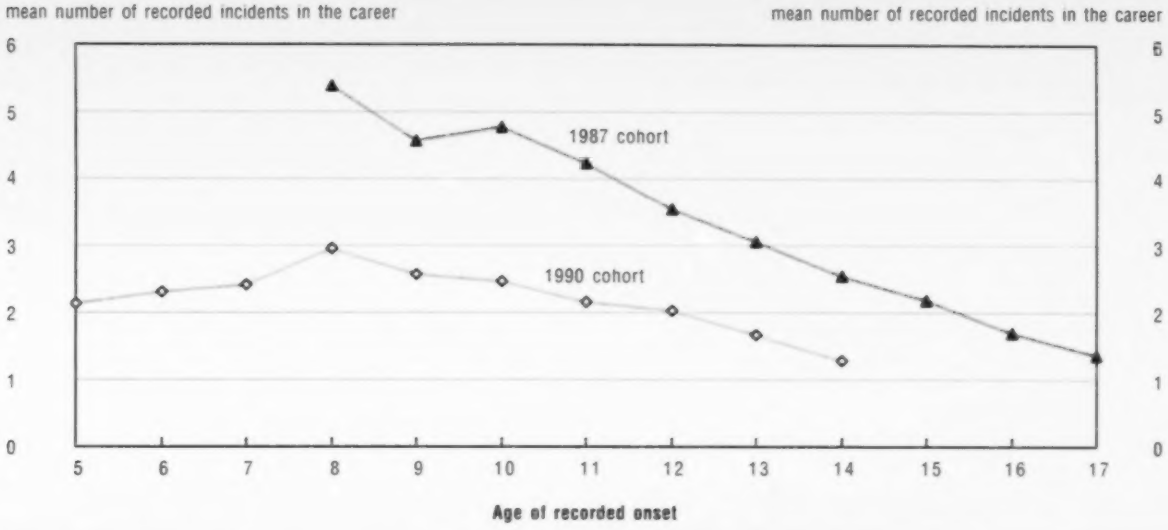
Chart 32 shows the relationship between the number of incidents in the career and the offender's age of recorded onset. In the 1987 birth cohort, there is a clear downward trend[40] in recorded delinquent activity with increasing age of onset: from an average of 5.4 recorded incidents in the career for those whose first incident was at the age of 8 to only 1.4 incidents for those whose first recorded incident was at 17 years of age. In the 1990 birth cohort, there is a similar pattern for those with ages of onset of 8 to 14, although the numbers of incidents are lower because members of this cohort are not tracked through the high-activity ages of 15 to 17.[41] However, contrary to expectations, children with very early onset (5 to 7 years of age) are not the most active offenders: on average, they are involved in no more recorded incidents during the period of observation than those with onset at 8 to 10 years of age. Since their delinquent careers last longer (see "The Duration of the Delinquent Career", above), this implies that their annual rate of recorded offending, averaged over the length of the career, is lower.

The downward trend in activity with age of onset from ages 8 to 17 (Chart 32) is not due to different periods of time "at risk" of committing crime: offenders born in 1987 whose first recorded incident was at the age of 17 were at risk of committing recorded crimes for the same 10 years as those whose first incident was at the age of 8: the fact that the first (recorded) incident of the former was very late in the period of observation simply reflects a lack of (recorded) criminal activity during most of the period.[42] Nor does the downward trend *necessarily* reflect a higher propensity to commit (recorded) crime on the part of those with early onset. An inverse relationship between age of onset and the number of incidents in the career is also observed in simulated data in which the propensity to offend is the same for all persons.[43] Further research is needed to determine to what extent this downward trend is due to systematic versus random differences in the propensity to commit (recorded) crime.

Catalogue no. 85-561-MIE2007009

Chart 32

Delinquent activity by the age of onset

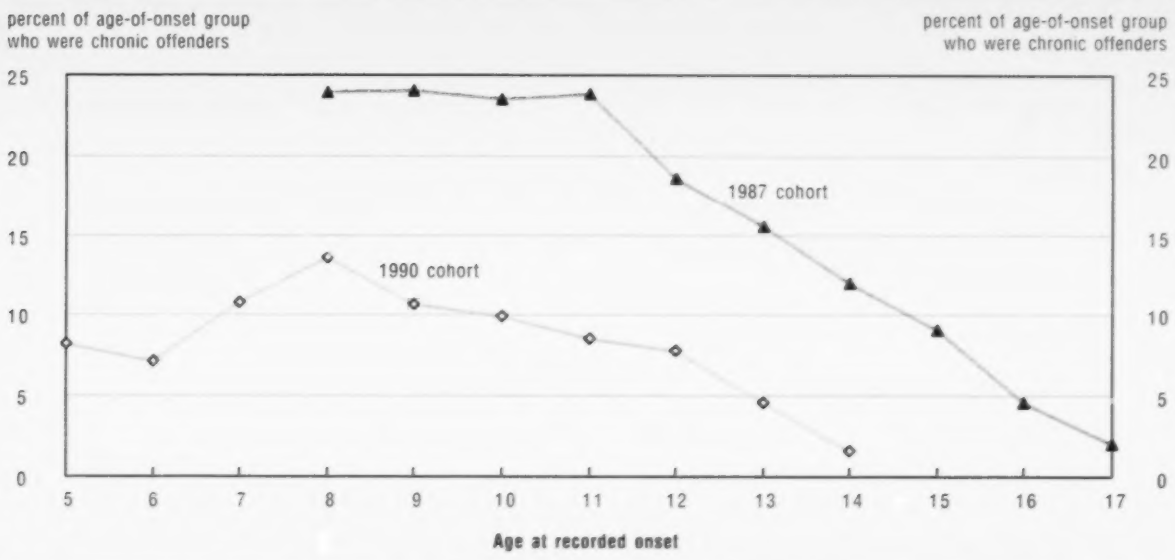


Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

Similar but not identical results are obtained by plotting the percentage of chronic offenders (those who have five or more recorded incidents in their careers) against the age of onset (Chart 33). In the 1987 birth cohort, the percentage of chronic offenders is constant for ages of onset of 8 to 11 years, then decreases with increasing age of onset. The decrease in chronic offenders with increasing age of onset is also apparent in the 1990 cohort, but not for offenders whose recorded careers began before the 8th birthday. Thus, both analyses indicate that within the age ranges covered by this study, *very* early onset offenders do not commit more crime and are not more likely to be chronic offenders than those with onset between the ages of 8 and 11. This finding appears to contradict the results generally reported in the literature of greater criminal activity by earlier onset offenders. However, there are a couple of possible explanations for this unexpected finding which are not necessarily inconsistent with the results generally reported in the literature. One possibility is that the much lower rates of offending which characterize the years from the 5th to the 8th birthdays[44] offset the impact of early onset on the offender's total activity up to the age of 14: perhaps if these offenders were followed for a longer period, accumulated offending by those beginning their careers before the 8th birthday might outstrip that of later-onset offenders. Another possible explanation is that the true rate of offending by 5 to 7 year olds may be higher than that of 8 to 10 year olds, but this may be hidden by a greater tendency on the part of the public to report, and of the police to record, the involvement of older children in criminal activity than that of younger children.

Chart 33

The percent of chronic offenders in each age-of-onset group



Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

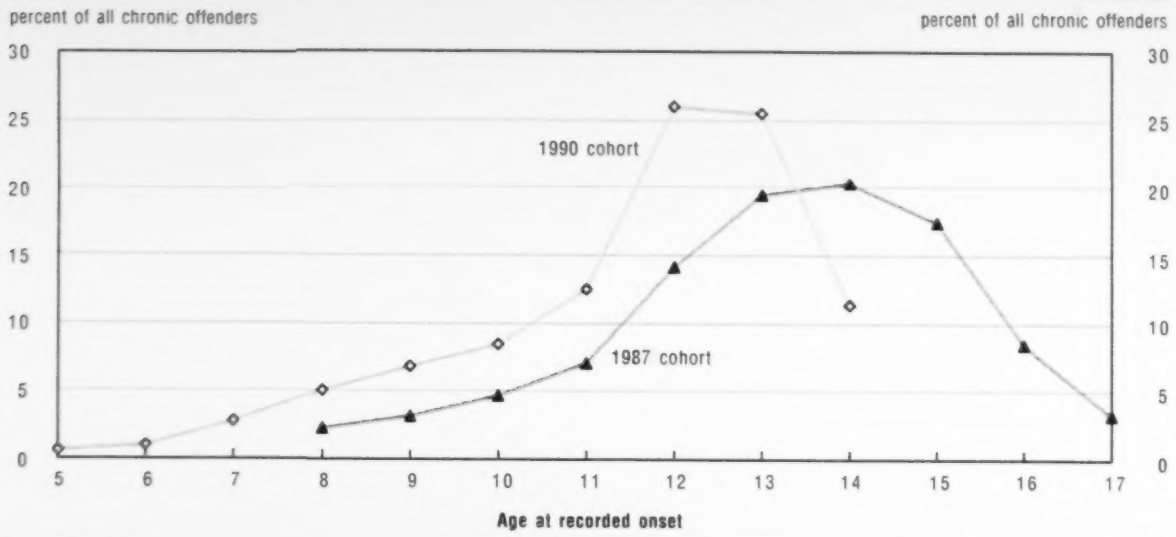
A rather different view of the relationship between the age of onset and chronic offending can be seen in Chart 34, which shows the percentage of all chronic offenders in the cohort accounted for by each age-of-onset group. It is the later-onset groups which contribute the greatest numbers of chronic offenders in these two cohorts: those in the 1990 cohort whose first incidents were at 12 and 13, and those in the 1987 cohort whose ages of onset were 12 to 15.[45] The reason for this is that the number of cohort members with later ages of onset is so much greater than those with early onset that they contribute greater numbers of chronic offenders, although the probability of any one of them becoming a chronic offender is lower than for early onset offenders.

This effect can also be seen in Chart 35, which shows the total recorded criminal activity (number of incidents) for each age-of-onset group. In both cohorts, the early onset offenders as a group are responsible for very little volume of crime compared to those who began offending in their early teens. It appears from the pattern for the 1987 cohort that offenders whose first recorded incident took place at the age of 14 were, as a group, responsible for the greatest volume of crime, followed by those with onset at 15 and 13, then by those with onset at 16, 17, and 12. However, the numbers for those with onset at 16 and 17, are probably underestimated, due to data truncation.[46]

Catalogue no. 85-561-MIE2007009

Chart 34

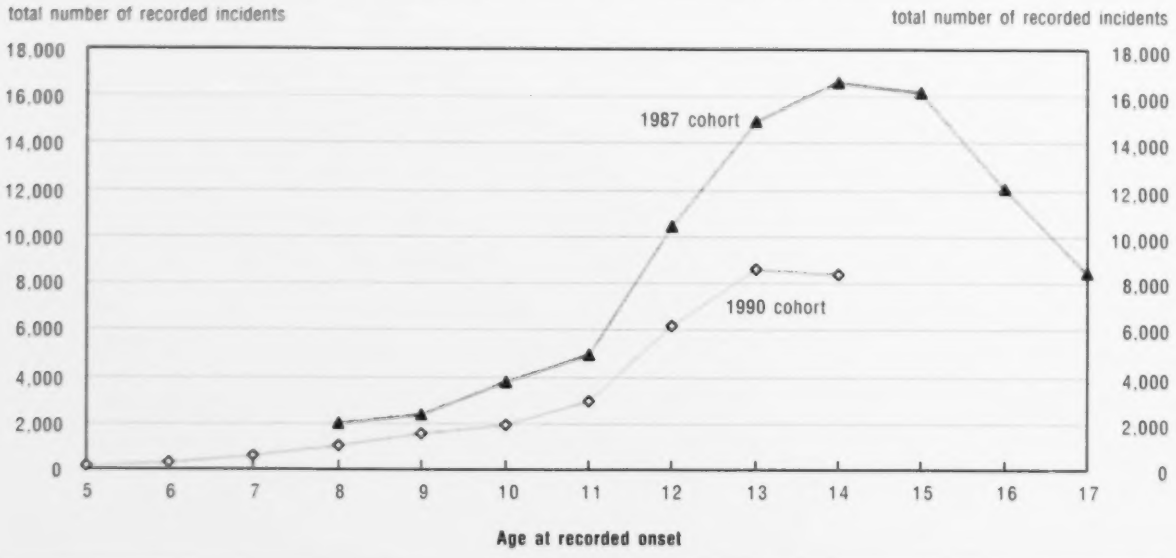
The percent of all chronic offenders accounted for by each age-of-onset group



Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

Chart 35

The total number of recorded incidents accounted for by each age-of-onset group



Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

This does not necessarily contradict other studies which have found that early onset offenders are responsible for greater amounts of crime. "Early" and "late" are relative terms. Most studies of delinquent and criminal careers using police or court data have necessarily begun tracking offenders at the 10th birthday or later. Thus, onset at 13 to 14 years old, which is relatively "late" in the present study, would be relatively "early" in a study which tracked offenders from 10 to 32 (Farrington, 1992) or from 12 to 21 years of age (Carrington et al., 2005). Also, it may be, as writers following Moffitt (1993) would predict, that the early-onset offenders in this study whose careers do continue into adulthood will eventually be responsible, as a group, for more recorded crime than the later-onset offenders, because they will continue to offend for considerably longer and/or at a higher rate. However, this seems unlikely, given the much greater number of later-onset offenders. Avoiding relative and ambiguous terms such as "early-" and "late-" onset, and predictions of the future, what can be said with certainty is that although the childhood-onset offenders[47] in the present study committed more recorded crime per offender than the adolescent-onset offenders (Chart 32),[48] they were responsible as a group for much less recorded crime during the period of observation (Chart 35), because there were so few of them: they make up only 11% of all offenders in the study and were responsible for only 17% of the total volume of recorded crime attributed to members of these two birth cohorts.

Specialization and versatility in offending

Criminological research on representative samples of offenders, rather than case histories of "professional" criminals, has consistently found little or no evidence of specialization in specific types of crime, but much evidence of specialization in broad categories of crime (Piquero et al. 2007: 75). However, specialization is more common in adult offenders than in children or adolescents (*Ibid.*). This section examines specialization and its obverse, versatility, in the delinquent careers of repeat offenders in the two birth cohorts. Offences are classified into three broad categories: offences against the person, offences against property, and other offences. Delinquent careers consisting of only one of these three categories are classified as specialized; those which include offences in two or three categories are classified as versatile. Thus, the criterion of specialization is quite broad.[49]

Unlike the analyses in the other sections of this report, the analyses of specialization and versatility use information on up to four different violations of the law occurring in each incident.[50] Thus, it is possible for a career consisting of only one incident to be classified as versatile, if the offences allegedly committed in the course of the incident fall into two or more of the three broad categories of crime. In reality, this is rare: only 4.3% of single-incident careers were classified as versatile. This is probably because the majority of incidents recorded in the UCR2 have only one violation coded: of approximately 123,000 incidents included in this study, only 22,000, or 18%, have a second violation coded; only 6,000, or 5%, have a third violation, and only 1,800, or 1.5% have all four violation fields completed. Since single-incident "careers" characterize the majority of the study population (see the previous section), and 96% of them are specialized - almost by definition – their inclusion in the analyses would greatly skew the results. Therefore, the analyses are performed only on the careers of "repeat offenders": those with at least two incidents. The 18,753 repeat offenders constitute one-third (33.4%) of the offenders in the study.

The first two columns of Table 7 show the distribution of the careers of the repeat offenders in each cohort into specialized and versatile, and the sub-types of each category. The last four columns further sub-classify the careers according to the presence or absence of administrative offences. Thirty-five percent of repeat offenders born in 1987, and 43% of those born in 1990, had specialized delinquent careers. The percentage of specialists among repeat offenders born in 1987 (35%) is the same as that reported for court careers of 12 to 21 year olds born in 1979/80 (Carrington et al. 2005). Of the specialized offenders, 28% in the 1987 birth cohort and 15% in the 1990 cohort also had administrative offences in their careers. The proportions with administrative offences are much lower than Carrington et al. reported in their study of court careers (57%): the difference reflects the very low numbers of administrative offences committed by children under 12 years of age, and also pre-court screening processes which affect the composition of the study population in court-based research.

Table 7

Specialization and versatility in the delinquent careers of repeat offenders

	Total		No administrative offences		One or more administrative offences	
	percent	number	percent	number	percent	number
1987 birth cohort						
Specialized						
Person	6.9	960	64.6	620	35.4	339
Property	23.8	3,311	74.8	2,477	25.2	834
Other	4.1	573	75.5	432	24.5	140
Administrative	0.4	58	...	...	100.0	58
Subtotal specialized	35.2	4,902	72.0	3,530	28.0	1,372
Versatile						
Person, property	19.4	2,704	66.9	1,809	33.1	895
Person, other	7.0	971	70.5	685	29.5	287
Property, other	19.0	2,643	72.3	1,910	27.7	733
Person, property, other	19.4	2,703	39.3	1,063	60.7	1,640
Subtotal versatile	64.8	9,022	60.6	5,467	39.4	3,554
1987 total	100.0	13,924	64.6	8,997	35.4	4,926
1990 birth cohort						
Specialized						
Person	9.5	460	79.0	363	21.0	96
Property	30.8	1,489	86.4	1,287	13.6	202
Other	2.4	117	91.1	106	8.9	10
Administrative	0.2	11	...	...	100.0	11
Subtotal specialized	43.0	2,077	84.6	1,757	15.4	320
Versatile						
Person, property	26.9	1,301	76.7	998	23.3	303
Person, other	5.2	252	83.2	210	16.8	42
Property, other	13.6	654	82.4	540	17.6	115
Person, property, other	11.3	545	53.6	292	46.4	253
Subtotal versatile	57.0	2,752	74.1	2,039	25.9	714
1990 total	100.0	4,829	78.6	3,796	21.4	1,033
Both cohorts	100.0	18,753	68.2	12,793	31.8	5,960

... not applicable

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

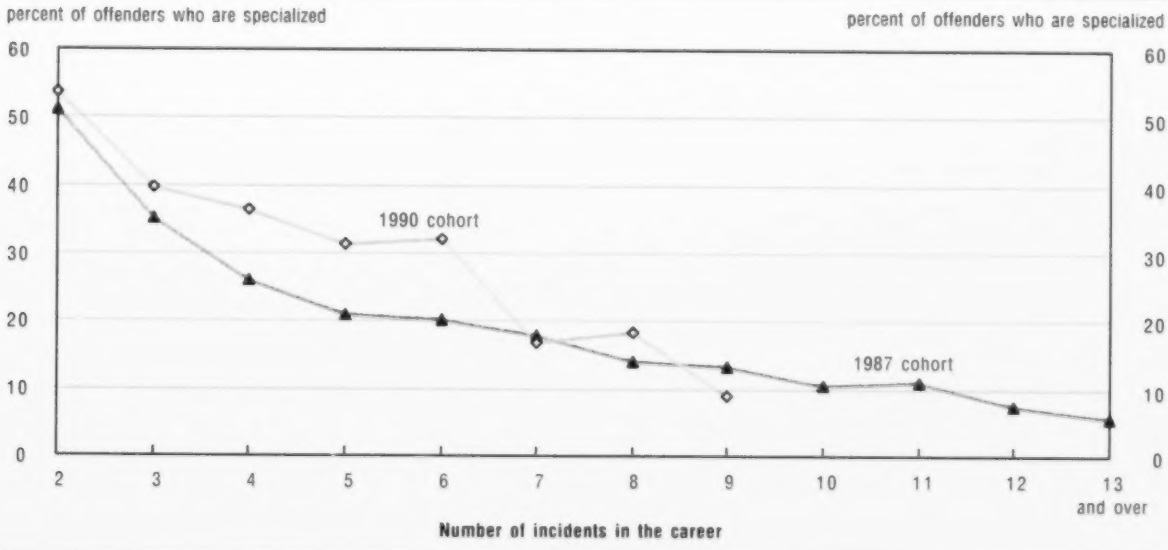
Catalogue no. 85-561-MIE2007009

Only 7% (in the 1987 birth cohort) and 10% (in the 1990 cohort) of repeat offenders were specialized in offences against the person, and even fewer (4% and 2%) in "other" offences. The majority of specialized careers were in property offending (24% and 31% of repeat offenders). Careers specialized in property offences – with or without administrative offences – are the most common of the eight types of careers. Versatile careers in the 1987 birth cohort are split fairly evenly among three groups - property and person offences, property and other offences, and all three types of offences – with a much smaller number of careers including only person and "other" offences. In other words, versatile careers tend strongly to include property offences. The proportions are similar for repeat offenders born in 1990, except that careers consisting of property and person offences are much more common than the other types.

Chart 36 shows the relationship between specialization and the number of incidents in the career, for the repeat offenders in each birth cohort.[51] The prevalence of specialization is inversely related to the number of incidents in the career. The curve for the 1987 birth cohort is much smoother, and shows that the decrease in the likelihood of specialization is especially pronounced as the number of incidents in the career increases from 2 to 5: the proportion of specialized careers drops from 50% to 20%. Over 90% of careers with 12 or more incidents are versatile. Figure 36 suggests the same conclusion that has been arrived at by most other research on the subject: that specialization and versatility in offending are largely explained by the volume of offending rather than by a tendency towards specialization or versatility on the part of the offender (Carrington et al. 2005: 30; Piquero et al. 2007: 79).

Chart 36

The proportion of specialized careers by the number of incidents in the career, by cohort



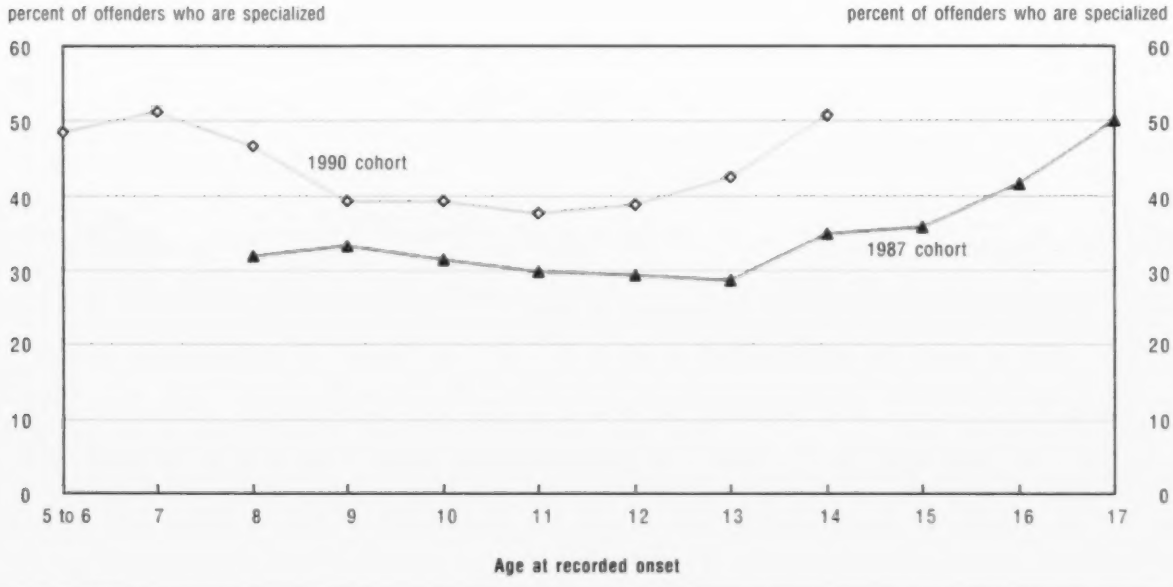
Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

Since the age of the onset of offending has been found to be related to many other characteristics of the criminal career, it is of interest to know whether early-onset offenders are more or less likely to be specialized or versatile in their delinquent careers. Previous research on adolescent and adult offenders suggests a positive relationship between the age of onset and the likelihood of specialization: as the age of onset increases, the number of incidents in the career decreases, and therefore the likelihood of specialization increases (Carrington et al. 2005: 31; Piquero et al. 2007: 71-72). In other words, early-onset offenders are more likely to be versatile.

Chart 37 shows the relationship between the age of onset and specialization, for repeat offenders in each birth cohort.[52] The expectation is confirmed only for offenders whose first recorded offence occurred at the age of 11 or older (for the 1990 cohort) or 13 or older (for the 1987 cohort). For offenders whose first recorded offence took place during childhood, specialization *decreases* with increasing age of onset: that is, early-onset offenders are *more* likely to be specialized. For offenders born in 1990, this could be due to the anomalous increase in total delinquent activity with increasing age of onset (see Chart 32), but that explanation does not apply to offenders born in 1987, for whom both the mean number of incidents in the career (Chart 32) and the prevalence of specialization (Chart 37) decrease with age of onset from 10 to 13 years. In view of the small numbers of accused at ages 5 to 9, the apparent trend should be interpreted with caution.

Chart 37

The proportion of specialized careers by the age of onset of the career, by cohort

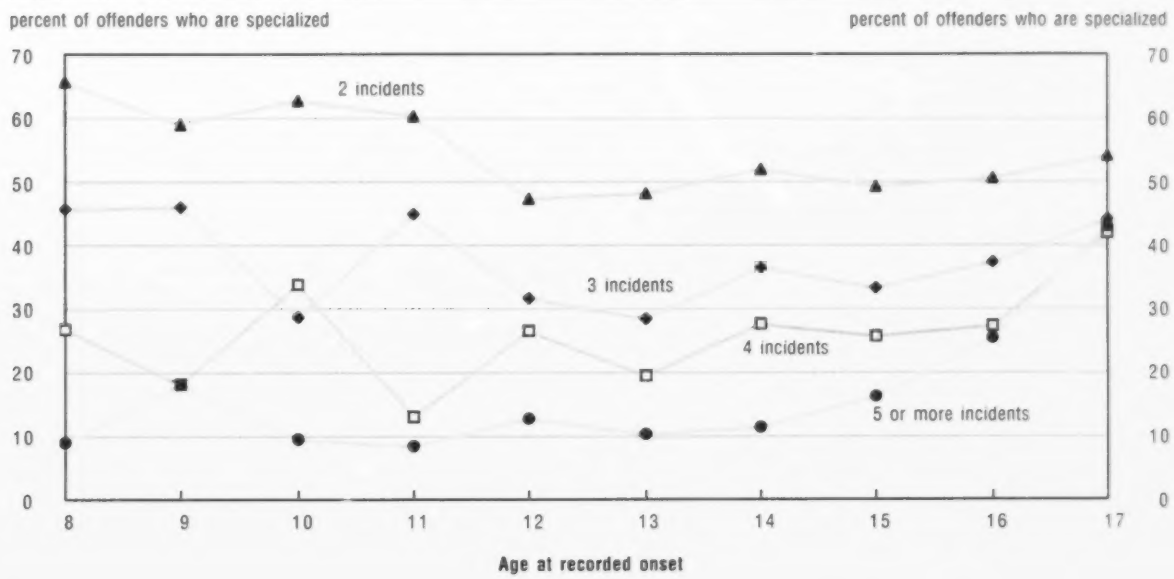


Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 38 distinguishes the influence on specialization of the number of incidents in the career and the age of onset of recorded offending. In Chart 38, the proportion of specialized careers for offenders born in 1987[53] is plotted against the age of onset, separately for offenders with 2, 3, 4, and 5 or more incidents in the career. As in Chart 36, the prevalence of specialization decreases as the number of incidents increases: for practically all ages of onset, careers with only 2 incidents have the highest levels of specialization, followed by careers consisting of 3 incidents, and so on. Although there are fluctuations due to small cell sizes, the four curves in Chart 38 generally exhibit a pattern of a decrease in the prevalence of specialization as the age of onset increases from 8 or 9 to 13, then an increase as the age of onset increases to 17.[54] Since the curvilinear relationship, shown in Chart 37, between the age of onset and the prevalence of specialization is reproduced even after controlling for the number of incidents (Chart 38), it is not due merely to the relationship between the age of onset and the number of incidents in the career, but rather appears to be a genuine age-related phenomenon. The increase in specialization with increasing age of onset for ages of onset of 11 or more is consistent with other research, but the decrease in specialization with increasing age of onset for ages of onset of 7 to 11 (in the 1990 cohort) and 9 to 13 (in the 1987 cohort) is unexpected.

Chart 38

The proportion of specialized careers by the age of onset and the number of incidents in the career, 1987 cohort



Source: Statistics Canada. Canadian Centre for Justice Statistics. Incident-Based Uniform Crime Reporting (UCR2) Survey. Linked 11-year data file.

Changes in the seriousness of offending over the delinquent career

The research evidence on changes in the seriousness of crime over the course of the delinquent or criminal career is mixed. Some research has found evidence of an increase in seriousness, or escalation; other studies have found evidence of a decrease in seriousness, or de-escalation; but the majority of studies have concluded that the seriousness of offending tends to be "relatively stable" over the career (Piquero et al. 2003: 387-388, 452; Kyvsgaard, 2003: 173-174). The trend in the seriousness of offending over the career is not necessarily monotonic: evidence has been found by at least one study of an inverted U-curve in longer careers, with the seriousness of offending increasing in the earlier part of the career, then decreasing later in the career (Kyvsgaard 2003: 177). Previous Canadian research using court data found "no pronounced tendency to escalation, stability, or de-escalation", with 41% of court careers being characterized by de-escalation, 31% by escalation, and 28% by stability (Carrington et al. 2005: 33-34).

One simple method of studying changes in seriousness over the career is to compare the most serious offence allegedly committed in the first and last incidents in the career. In Table 8, incidents are classified into 6 levels of seriousness, ranging from the least serious – those whose most serious offence was a summary or hybrid "other" offence – to the most serious – those whose most serious offence was an indictable offence against the person. Only substantive incidents[55] are included in the analysis, and only those offenders with at least two substantive incidents in their careers are included. Careers are cross-classified in Table 8 by the most serious offence involved in the first substantive incident in the career (in the rows of the table), and whether the most serious offence in the last incident in the career was in a more serious category than the first (escalation), the same category of seriousness as the first (stability), or a less serious category (de-escalation). The last ("Total") row for each birth cohort shows that in the overall distribution of careers, there are substantial numbers of careers with each of the three patterns. Overall, stability is the most common pattern in both cohorts, followed by de-escalation and then escalation. The numbers of careers exhibiting escalation and de-escalation are very similar. Therefore, there is definitely no overall tendency towards either escalation or de-escalation.

The analysis in Table 8 suffers from two limitations. One is the relatively crude measurement of seriousness, in only 6 levels, with only an intuitive rather than empirical basis for their order. The second limitation is the inclusion of only the first and last (substantive) incidents in the career, which precludes detection of more complex career patterns than simply escalation, de-escalation or stability. Both limitations are overcome in Chart 39, where the x-axis is the order of the incident in the delinquent career: the first substantive incident in the career, second substantive incident, etc., for all incidents in the career. The y-axis shows the mean seriousness of the most serious recorded substantive offence in all incidents of a given order: first, second, etc.[56] Here, seriousness is measured by the *seriousness scale* developed by Canadian Centre for Justice Statistics to rank the seriousness of criminal offences.[57]

Catalogue no. 85-561-MIE2007009

Table 8

Changes in seriousness from the first to the last recorded substantive incident, by birth cohort

	Escalation	Stability	De-escalation	Total	Total
			percent		number
1987 cohort					
Indictable person	...	17.6	82.4	100.0	504
Hybrid person	6.6	39.4	54.0	100.0	2,991
Indictable property	20.5	20.1	59.4	100.0	1,450
Summary/hybrid property	33.2	47.5	19.2	100.0	6,314
Indictable other	49.2	17.2	33.6	100.0	244
Summary/hybrid other	69.9	30.1	...	100.0	1,628
Total percent	29.3	38.8	31.9	100.0	13,131
Total number	3,852	5,092	4,187	13,131	...
1990 cohort					
Indictable person	...	18.7	81.3	100.0	114
Hybrid person	3.3	46.3	50.3	100.0	1,237
Indictable property	26.2	20.3	53.5	100.0	496
Summary/hybrid property	32.4	55.8	11.9	100.0	2,385
Indictable other	63.7	10.3	26.0	100.0	62
Summary/hybrid other	70.7	29.3	...	100.0	373
Total percent	**26.7**	**45.9**	**27.4**	**100.0**	**4,669**
Total number	1,247	2,141	1,280	4,669	...

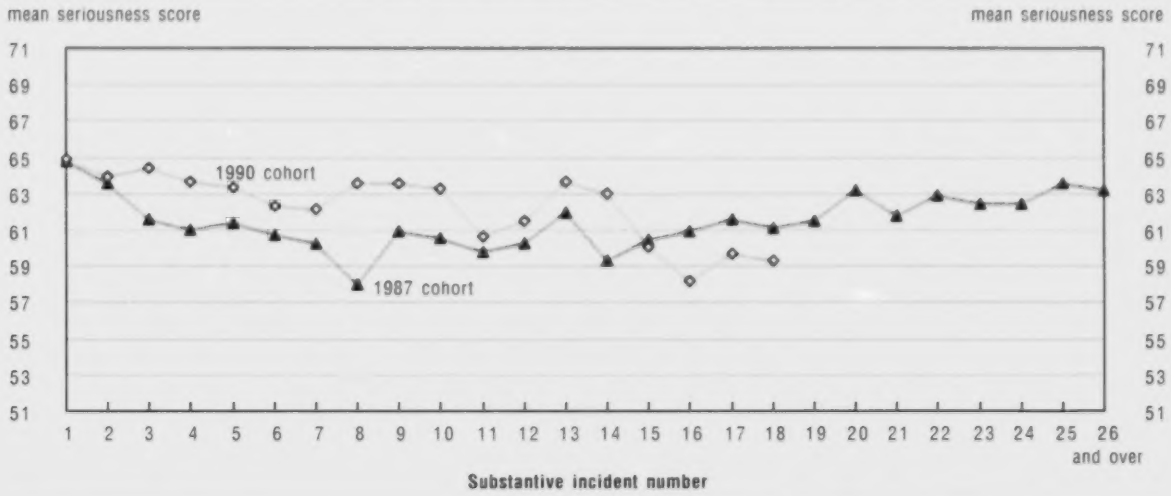
... not applicable

Note: Includes offenders with 2 or more substantive incidents only.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Chart 39

The mean seriousness of substantive incidents, by their substantive incident number and cohort



Note: For the 1990 cohort, incidents after the 18th are omitted, due to unreliability due to small numbers. For the 1987 cohort, incidents after the 26th are combined as '26 and over'.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

There is no evidence of escalation in Chart 39. The mean seriousness of substantive incidents fluctuates around 62 for both cohorts, with no evident upward or downward trend as the incident number in the career increases. When the seriousness score of the incident is regressed on the incident number, the slope for offenders born in 1987 is small and statistically non-significant (b = 0.035, std. err. = 0.042, p = .40), i.e. neither significantly positive (indicating escalation) nor significantly negative (indicating de-escalation). For offenders born in 1990, the regression slope is negative and statistically significant (b = -0.295, std. err. = 0.054, p < .001), i.e. the overall pattern is one of de-escalation.

Visual examination of the plot for the 1987 cohort suggests a U-shaped curve, with de-escalation for the earlier incidents in the career (up to the 14th incident), followed by escalation. This is confirmed by performing separate regressions on the first 14 points and the 14th to 25th points. For the first 14 points for the 1987 cohort, the slope is negative and statistically significant (b = -0.25, std. err. = 0.09, p = .017); for the 14th to 25th points, the slope is positive and statistically significant (b = 0.30, std. err. = 0.05, p < .001). The absolute values of the two slopes are approximately equal, and approximately equal to the absolute value of the regression slope for the first 18 points for the 1990 cohort. It may well be that the finding of overall de-escalation for offenders in the 1990 cohort is due to the cut-off at the 18th incident, and that extension of the plot to the 25th incident would also yield a U-shaped curve. The finding for offenders born in 1987 of de-escalation followed by escalation in seriousness is partly consistent with Kyvsgaard's findings (2003: 177), which are based on an analysis that examined careers of different lengths separately: she also found de-escalation in careers with few incidents, but she found an *inverted* U-curve for careers with many incidents.

Summary and conclusions

This report has examined the involvement in police-reported crime during 1995 to 2005 of children and youth born in 1987 and 1990, in the parts of Canada covered by the Incident-Based Uniform Crime Reporting Survey. The coverage of the UCR2 Survey during this period was about half of Canada by population. The police-reported offences committed by each member of the study population were linked together to form records of their delinquent careers. Each person was tracked for exactly 10 years: those born in 1987 were tracked from their 8th birthday to the day before their 18th birthday, and those born in 1990 were tracked from their 5th to the day before their 15th birthday.

By their 18th birthday, just under one-fifth (18.5%) of all persons born in 1987 had been recorded by police as having committed a criminal offence: one-quarter of boys and one-eighth of girls. One in 11 boys had allegedly committed an offence against the person, one in six an offence against property, and one in ten an other offence. Thus, particularly in the case of boys, recorded delinquency is fairly widespread among the population. This finding is consistent with similar research conducted in other countries (reviewed in Piquero et al., 2003), and with Canadian research based on youth court records (Carrington et al., 2005).

The great majority of these young offenders were involved in recorded crime during their teenage years and not as children: less than 2% of persons born in 1987 and 1990 were involved in recorded crime prior to their 12th birthday. To some extent, this may reflect under-reporting by the public or under-recording by police of criminal activity prior to the age of criminal responsibility. Although this study ends at the 18th birthday, there is no sign that the numbers of new first-time recorded offenders were levelling off at that age: on the contrary, it appears likely that substantially more than one-fifth of the population would be recorded as criminal offenders if the age range covered by the study were extended. This is also confirmed by the results of research in other countries which has tracked criminal activity into early and middle adulthood (Piquero et al., 2003), and by Canadian research using court data which found that 43% of persons appearing in court between the 12th and 22nd birthdays had been charged for the first time in their lives in connection with an alleged offence committed after their 18th birthday (Carrington et al., 2005).

The number of children and youth involved in recorded crime increases with each year of age from very few 5 year olds to a peak of one in every 17 persons at the age of 16. Peak participation in recorded crime is reached one year earlier by girls, at 15. The proportion of property offenders decreases with age from more than 90% of 5 year old offenders to 50% of 17 year olds, while the proportion of offenders against the person increases from less than 10% of 5 year olds to 30% of 17 year olds. "Other" offenders increase from zero at 5 years old to more than 40% of offenders at 17, and the proportion of "other" offenders shows no sign of levelling off, unlike the other two categories of offenders.

The average number of recorded offences committed per year by offenders also increases with age, but not as dramatically as the prevalence of offenders among the population. It rises from an average of 1.1 incidents for 5 to 8 year old offenders to a peak of 1.8 incidents per 15 year old offender: 1.9 for boys and 1.4 for girls. The increase in average activity from 8 to 11 years of age is largely in offences against the person by boys; from 12 to 15 years, it is largely in administrative and drug offences by both sexes.

While recorded criminal activity is fairly widespread among Canadian youth, the amount of recorded crime committed by most child and teenage offenders is quite small and concentrated among the less serious types of crime. The term "delinquent career" is rather a misnomer for almost two-thirds of offenders born in 1987—59% of boys and 76% of girls—who had only one recorded offence during the observation period. Only 10% of offenders born in 1987 had five or more recorded offences, and might therefore be called "chronic" or "persistent" offenders. These offenders averaged 11 recorded offences each, and were responsible as a group for 46% of all recorded crime committed by the 1987 birth cohort. Overall, offenders born in 1987 committed an average of 2.4 recorded offences, or 2.1 if administrative offences are excluded, over the 10 year period from their 8th to their 18th birthday.

About one-quarter (24%) of the offences allegedly committed by these youth were minor thefts, and 15% were either minor property damage ("mischief"), possession of stolen property, or fraud. Nine percent were minor assaults and 10% were drug offences, almost all being simple possession of cannabis. However, almost one-fifth (18%) were very serious offences: robbery, assault with a weapon or causing bodily harm, sexual assault, other offences against the person, break and enter, and major theft. No evidence was found that delinquent careers tend to progress from less to more serious offences. The notion of "progression" is inapplicable to the majority of careers, which consist of only one offence. However, even among repeat offenders, the offences which occurred later in the career were not, on average, more serious than those occurring earlier.

Little evidence was found of specialization in one type of crime on the part of these offenders, even when the type of crime is defined very broadly in the three categories of offences against the person, against property, and "other" offences. Two-thirds of repeat offenders born in 1987 had more than one type of crime in their career. Furthermore, there is a strong inverse relationship between specialization in one type of crime and the number of offences in the career: 50% of delinquent careers with only two recorded offences were specialized, compared with 20% of those with 5 offences, and 10% of careers with 10 or more offences. This suggests that where "specialization" is observed, it is more a function of committing few offences than of a tendency to specialize on the part of the offender. Among the 35% of repeat offenders with specialized careers, 24% were specialized in property offending, 7% in offences against the person, and 4% in "other" offences.

The recorded age of onset of a delinquent career is defined as the age at which the first recorded offence was allegedly committed. The number of offenders with recorded onset during childhood is very low, and rises rapidly during the teenage years. If childhood onset is defined as occurring before the 12th birthday, then 11% of offenders in both cohorts were childhood-onset offenders. The peak age for recorded onset of offending is 15, when 3.7% of all persons born in 1987 began their delinquent careers: 4.8% of boys and 2.6% of girls. The peak age for boys is one year later at 16, when 4.9% began their delinquent careers. Thus, almost one in

10 of all boys born in 1987 – or about 40% of male offenders born in 1987 – began their delinquent careers at 15 or 16 years of age. The peak age of onset for offences against the person and against property is also 15, but the peak age of onset for other offences is unknown, as the numbers continue to rise to the end of the period of observation (the 18th birthday).

Consistent with the results of other research, it was found that childhood-onset offenders tend to have delinquent careers which last longer within the limits of the period of observation and include more criminal incidents than offenders with later onset. However, it is adolescent-onset offenders who are responsible, as a group, for most recorded crime (83%), because there are many more of them – they make up 89% of all offenders in the study.

It is difficult to draw conclusions about the duration of the delinquent and criminal careers of this population, because no information was available on their offending after the 18th birthday. Thus, we do not know whether their "delinquent careers" continued into adulthood as "criminal careers". Fifty-nine percent of offenders in this study had a recorded offence during the last 2 years of observation and therefore might well have had careers which extended beyond the period of observation. Indeed, a substantial proportion of all the offenders in this population had careers which began only in the last 2 years of observation. The remaining 41% of careers which could be considered to have ended before the 18th birthday were typically of very short duration. About four-fifths had only one recorded offence, and therefore a duration of zero. The remaining completed careers (comprising about 9% of all delinquent careers) had an average duration of 1 year and 3 months.

It is tempting to see the age-crime curve in Chart 1 as summarizing the shape of the developmental curves of the many delinquent careers included in this study. However, that would be a serious misinterpretation. Very few of the recorded delinquent careers in this study spanned the entire 10 year period of observation. Rather, the curve shown in Chart 1 represents the aggregation of many very short careers and a few longer ones – the majority, indeed, comprising only one offence and therefore appearing in Chart 1 as a constituent of only a single point. For the majority of offenders in this study, the concept of the "delinquent career" is not really applicable. Even among repeat offenders, most delinquent careers are of short duration and include few recorded offences. On the other hand, the few "chronic" or "persistent" offenders – comprising 10% of offenders born in 1987 - who committed five or more recorded offences over the 10 year period, were responsible for a disproportionate amount (46%) of all crime committed by members of this birth cohort.

Methodology

Data source: The Incident-Based Uniform Crime Reporting Survey

This report uses data from the Incident-Based Uniform Crime Reporting Survey, or "UCR2", which captures detailed information about each incident recorded by the information systems of participating police services. The main limitation of the UCR2 as a data source is that it has not yet achieved full national coverage of Canada. It is being phased in over time, as police services in Canada are able to implement changes to their records management systems which will accommodate the enhanced information requirements of this survey. The coverage of the UCR2 has increased, since its inception in 1988, to 122 police services and detachments in 9 provinces, accounting for 71% of the population of Canada, in 2005. However, in order to study the development of delinquency over the period from 1995 to 2005, the data in this study are taken from a subset of police services in 6 provinces which have reported consistently to the UCR2 since 1995.[58] The selected police services accounted for approximately 52% of the population of Canada during the period from 1995 to 2005.

The police services included in this study are concentrated in the province of Québec and urban Ontario. Of the 61 police services and detachments included in the study, 39 are in Québec, and represent close to 100% coverage of that province. Ten are municipal police services in cities in Ontario, providing coverage of 51% of the population of that province. The remaining 12 respondents in the study are municipal police services in cities and towns in New Brunswick (5 services; 16% coverage of the provincial population), Saskatchewan (3 services; 42% coverage), Alberta (3 services; 54% coverage), and British Columbia (1 service; 14% coverage). However, the numbers of police services give a misleading picture of the geographical distribution of the coverage of the data, because many in the province of Québec provide policing services to relatively small populations. In terms of the population in 2005 of the parts of Canada covered by this report, police services in the province of Québec account for 47%, in Ontario for 35%, in Alberta for 11%, in British Columbia for 4%, in Saskatchewan for 3%, and in New Brunswick for 1%. Therefore, the findings presented in this report apply mainly to the province of Québec and to urban Ontario, and to a lesser extent to certain cities and towns in New Brunswick, Saskatchewan, Alberta, and British Columbia. However, the overall youth crime rate and distribution of types of recorded youth crime in the parts of Canada included in this study do not differ substantially from the youth crime rate and types of youth crime reported for Canada as a whole. This issue is discussed under the heading, "Delinquency in the Study Population and the National Population", above.

Catalogue no. 85-561-MIE2007009

The UCR2 Survey has one record for each person who has been identified by police as "chargeable" in relation to a criminal incident.[59] A "chargeable" person[60] is defined as one who "has been identified by police as being involved in a criminal incident and against whom an information [i.e. charge] could be laid as a result of sufficient evidence/information" (Canadian Centre for Justice Statistics, 2004: 80). A variable on this record indicates whether or not the chargeable person was in fact charged. All chargeable children and young persons, whether charged or not, are included in this study. The UCR2 Survey allows for up to four violations to be coded for each incident. If more than four violations occur in an incident, the four most serious are selected. These are recorded in the UCR2 in order of seriousness. Unless otherwise noted, the analyses in this report which involve the type of offence committed in the incident are based on the most serious recorded violation. As a result, less serious offences may be under-represented.

Study population

The study begins in 1995 because prior to that year, the UCR2 covered less than 50% of the population of Canada. Therefore, 11 years of data (1995 to 2005) were available. However, only 10 years of data were used for each individual, since each person was tracked from his or her birthday in 1995 to the birthday in 2005, so that the age range for each individual in the cohort would be the same. The cohort born in 1987 were selected for analysis because these persons had their 18th birthday in 2005. Thus it was possible to track them to the end of the period during which they were legally defined as "young persons"; that is, to the day before their 18th birthday. The earliest birthday from which they could be tracked was the 8th birthday, occurring during 1995.

Other research has established that very little recorded crime is committed by persons less than 8 years old. Therefore, study of the 1987 birth cohort alone was expected to capture the great majority of recorded crime involving children and young persons. Nevertheless, it was considered desirable to study the development of criminal behaviour from the earliest possible age. Therefore, persons born in 1990 were also included in the study population, in order to begin the study at the 5th birthday.[61] This also provided a substantial period of "overlap", from the 8th to the 15th birthdays, when data were available for both cohorts, which allowed verification of results by comparing results calculated separately for the two cohorts.

Population at risk[62]

The prevalence of, or participation in, recorded criminal behaviour is usually expressed in the criminal careers literature as the proportion of the cohort who committed an offence at a given age (*age-specific prevalence*), or ever committed an offence up to a given age (*age-specific cumulative prevalence*), or ever committed an offence during the period of observation (*overall* or *lifetime prevalence*). Calculation of such prevalence estimates requires both the number of persons who exhibited the behaviour, and the number of persons at risk of exhibiting it — the *eligible population at risk*.

Using the UCR2 data, one cannot track exactly the same group of individuals for the 10-year-period of observation. Each year, some individuals either immigrate to or emigrate from Canada or the parts of Canada included in the study, or move between the provinces under study. Therefore, the offenders included in this study,

and the larger population from which they are drawn, include persons who were present in the study area for less than the entire 10-year period of observation. Consequently, determining the exact *total eligible populations at risk* of committing a recorded offence is not possible. However, population data provided by Statistics Canada for each age and sex in the selected provinces may be used to approximate the populations at risk.

As a result of net migration, the total population of the 1987 and 1990 birth cohorts in the parts of Canada included in the study experienced a small but steady net growth between 1995 and 2005. The 1987 birth cohort increased from 179,000 8 year olds in 1995 to 209,000 18 year olds in 2005. This represents an average annual compounded increase of 1.6%, or an overall increase of 17% in the size of this cohort. The 1990 birth cohort increased from 193,000 5 year olds in 1995 to 216,000 15 year olds in 2005. This represents an average annual compounded increase of 1.1%, or an overall increase of 12% in the size of this cohort.

Age-specific prevalence rates are calculated using yearly population data to determine the approximate population of males and females in each specific year for that corresponding age group. Thus, changes in the population are not considered problematic because any gains or losses—through migration or death—are taken into account. However, when calculations of overall prevalence are concerned, the changing denominator (size of the total eligible population at risk) becomes problematic.

For purposes of estimating overall prevalence, the study utilizes the largest approximate population—the number of 15 year olds in 2005, for the 1990 birth cohort, and the number of 18 year olds in 2005 for the 1987 birth cohort—in its calculations. This approach accounts not only for the stable component of the original cohort size, but also the net growth experienced over time. This approach is also used in the companion report (Carrington et al., 2005). Lee (1999) used a similar approach and rationale in determining the total eligible population in presenting overall prevalence estimates in a study of youth crime trends in British Columbia for four separate cohorts. An alternative, and less desirable, method uses the number of live births in the cohort birth year as an approximation of cohort size throughout the time period under study (see Prime et al., 2001 for an example of this use).

Selection, matching, and weighting of UCR2 records

After selecting police services as described above, all records were selected which pertained to offences committed during 1995-2005 by individuals born in 1987, during the period from the 8th birthday to the day before the 18th birthday, and by individuals born in 1990, during the period from the 5th birthday to the day before the 15th birthday. The birthdays were used as the start and end dates for offence selection in order that each individual would be observed for the same length of time and age range (though not exactly the same period) "at risk" of committing crimes. Provincial and municipal offences were not included. A detailed breakdown of the offences which were included is given in Appendix Table A.1.

Records pertaining to the same individual were linked together in order to create the individual's delinquent career as the unit of analysis. This was not straightforward, since there is no unique person identifier in the UCR2. Record matching is done using the province, person's name, date of birth, and sex. This raises the issue of potential *false positive* matches. Different people have the same

name, date of birth and sex. Furthermore, the accused person's name is not recorded as such in the UCR2—it is encoded in a 4-character Russell Soundex code, which is not unique: many names are encoded with the same Soundex code.[63] Thus, matching on the Soundex code, date of birth and sex could result in false positive matches: records for different people would be erroneously treated as pertaining to a single person. The result would be an underestimate of the number of different offenders and an overestimate of the numbers of incidents in their careers.

False negatives—where two records should be matched but are not—are also a potential problem in record matching. A false negative could occur if police records contained more than one name for the same person; for example, if a person changed his or her name during the observation period, or used an alias, or if the name was misspelled. An incorrect record of the date of birth or sex would also result in a false negative. A false negative would also occur if the person committed crimes in more than one province, since all matching was done within provinces. Matching could have been done across the entire set of provinces which constituted the study population, in order to maintain the integrity of careers which crossed provincial boundaries, but this would have exacerbated the problem of false positives by increasing the size of the "pool" of persons being matched (see below for the relationship between the size of the pool and the probability of false positives).

An analysis of the probability of false positive matches was conducted by methodologists at Statistics Canada by determining the rate of occurrence of each Soundex code in the populations of the provinces in the study, using electronic telephone directories. This enabled the calculation, for each Soundex code, of the expected rate of false positives, when it was used for matching in combination with birth date and sex. Soundex codes vary greatly in their vulnerability to false positive matches, since some encode very common names and others do not.

The probability of false positives is directly related to the number of records being matched, which is approximately proportional to the population of the geographical area, and the number of years, within which matching is being done. There would be many false positives if records for many years for all of Canada were being matched, and few or none if records were matched for only a few years within one town. Thus, in a study such as the present one, where the number of years of data for which records are matched is fixed at 10 years, the "match quality" or "match efficiency" (i.e. non-vulnerability to false positives) of Soundex codes is related both to the commonness of the names which they encode, and to the population of the area within which matching is being done.

On the basis of this analysis, four categories of the match efficiency of Soundex codes were defined:

- **0** – The code is rare enough that there is 99% or better match efficiency rate.
- **1** – 95% to 99% match efficiency rate.
- **2** – 90% to 95% match efficiency rate.
- **3** – Less than 90% match efficiency rate.

"Match efficiency" refers to the expected absence of false positives; e.g. 99% match efficiency means that 1% of matches are expected to be false positives, and "99% or better" means that 1% or fewer false positive matches are expected.

Records (and therefore persons) whose Soundex codes had a 95% or better match efficiency (i.e. match quality codes of 0 or 1) were deemed to have an acceptable expected rate of false positive matches. The actual – rather than expected – match efficiency of the records with Soundex codes with a match quality code of 2 was assessed by linking records within the same province which had the same Soundex code, date of birth and sex, regardless of the match efficiency of the Soundex code. Duncan's multiple-range tests of the statistical significance of the differences in the mean numbers of records for the aggregated careers of "individuals"[64] with Soundex codes of match quality codes of 0, 1, and 2 were performed separately for each province. If Soundex codes with a match efficiency code of 2 were more vulnerable, in practice as well as in principle, to false positive matches than those with match quality codes of 0 or 1, then matching on these codes would be more likely to aggregate together the records pertaining to different individuals, which would result in a higher mean number of records per "individual" career.

The result of this analysis for individuals born in 1987 was that "individuals" whose Soundex codes had a match efficiency code of 2 did not have a significantly different number of records from "individuals" whose Soundex codes had match efficiency codes of 0 or 1, in any province. For those born in 1990, "individuals" whose Soundex codes had a match efficiency code of 2 had a significantly different number of records from "individuals" whose Soundex codes had match efficiency codes of 0 or 1 only in Saskatchewan, where the mean numbers of records per "individual" with Soundex match quality codes of 0, 1, and 2 were 1.7, 1.8, and 2.9, respectively. On the basis of this analysis, records with a Soundex match quality code of 0, 1, and 2 were retained for all provinces for persons born in 1987; and for persons born in 1990 except in Saskatchewan, where records with a Soundex match quality code of 2 were eliminated. All records with a Soundex match quality code of 3 were eliminated, for persons in both birth cohorts.

The rationale for simply eliminating records with Soundex codes which are unacceptably vulnerable to false positive matches is that, as a record selection criterion, Soundex codes (representing persons' names) are presumed to be unbiased with respect to criminal behaviour. A person with a common name such as John Smith, whose Soundex would probably have a match quality code of 3, is no more or less likely to have a criminal career, or a career with particular characteristics, than a person with an uncommon name and a Soundex match quality code of 0. Thus, the records with Soundex match quality codes of 0, 1, and 2 constitute a subset which is presumed to be representative of the entire population with respect to the phenomenon under study (criminal behaviour).

Records with the same province, Soundex code, date of birth and sex were then aggregated into person (career) records. To compensate for the deletion of records with a Soundex match quality of 3 (and of 2 for Saskatchewan for persons born in 1990), each person record was assigned a weight which was the inverse of the selection ratios. Therefore, all numbers of persons cited in the report are based on selected subsets of records, which are weighted in order to reproduce the original number of records.

Bibliography

Armstrong, Mark. 2000. *An Overview of the Issues Related to the Use of Personal Identifiers*. Statistics Canada Catalogue no. 85-602-XIE. Ottawa. Available at: http://www.statcan.ca:8096/bsolc/english/bsolc?catno=85-602-X

Bala, Nicholas. 2003. *Youth Criminal Justice Law*. Toronto. Irwin Law.

Besserer, Sandra and Cathy Trainor. 2000. "Criminal victimization in Canada, 1999." *Juristat*. Vol. 20, no. 10. Statistics Canada Catalogue no. 85-002-XIE. Ottawa.

Canadian Centre for Justice Statistics. 2000. *Canadian Crime Statistics, 1999*. Statistics Canada Catalogue no. 85-205-XIE. Ottawa.

Canadian Centre for Justice Statistics. 2004. *Canadian Crime Statistics, 2003*. Statistics Canada Catalogue no. 85-205-XIE. Ottawa.

Canadian Centre for Justice Statistics. 2006. *Uniform Crime Reporting Incident-Based Survey Reporting Manual*. Statistics Canada Unpublished manual. Ottawa. Available at: http://www.statcan.ca/english/sdds/instrument/3302_Q7_V2_E.pdf (accessed June 30, 2007).

Carrington, Peter J. 2002. "Group crime in Canada." *Canadian Journal of Criminology* Vol. 44. p. 277-315.

Carrington, Peter J. and Jennifer L. Schulenberg. 2003. *Police Discretion with Young Offenders*. Ottawa. Department of Justice Canada. Available at: http://canada.justice.gc.ca/en/ps/yj/research/carrington-schulenberg/report.html (accessed April 30, 2007).

Carrington, Peter J., Anthony Matarazzo, and Paul deSouza. 2005. "Court careers of a Canadian birth cohort." *Crime and Justice Research Paper Series*. Statistics Canada Catalogue no. 85-561-XIE. no. 6. Ottawa.

Farrington, David P. 1986. "Age and crime." In M. Tonry and N. Morris (eds.), *Crime and Justice: An Annual Review of Research*. Vol. 7. p. 189-250. Chicago. University of Chicago Press.

Farrington, David P. 1992. "Criminal career research in the United Kingdom." *British Journal of Criminology*. Vol. 32. p. 521-536.

Farrington, David P. and Per-Olof Wikström. 1994. "Criminal careers in London and Stockholm: A cross-national comparative study." In E. Weitekamp and H.-J. Kerner (eds.), *Cross-National and Longitudinal Research on Human Development and Criminal Behaviour*. Dordrecht. Kluwer.

Farrington, David P., Darrick Jolliffe, J. David Hawkins, Richard F. Catalano, Karl G. Hill, and Rick Kosterman. 2003. "Comparing delinquency careers in court records and self-reports." *Criminology*. Vol. 41. p. 933-958.

Hirschi, Travis and Michael R. Gottfredson. 1983. "Age and the explanation of crime." *American Journal of Sociology*. Vol. 89. p. 552-584.

Kazemian, Lila. 2007. "Desistance from crime. Theoretical, empirical, methodological, and policy considerations." *Journal of Contemporary Criminal Justice*. Vol. 23. p. 5-27.

Kazemian, Lila and David P. Farrington. 2006. "Exploring residual career length and residual number of offenses for two generations of repeat offenders." *Journal of Research in Crime and Delinquency*. Vol. 43. p. 89-113.

Kennedy, Leslie W. and Vincent F. Sacco. 1996. *Crime Counts. A Criminal Event Analysis*. Toronto. Nelson Canada.

Kyvsgaard, Britta. 2003. *The Criminal Career: The Danish Longitudinal Study*. Cambridge. U.K. Cambridge University Press.

Laub, John H. and Robert J. Sampson. 2003. *Shared Beginnings, Divergent Lives: Delinquent Boys to Age 70*. Cambridge. MA. Harvard University Press.

Lee, Naomi. 1999. "Youth crime trends in British Columbia." *Forum on Corrections Research*. Vol. 11. p. 3-6.

Moffitt, Terrie E. 1993. ""Life-course persistent" and "adolescent-limited" antisocial behaviour: A developmental taxonomy." *Psychological Review*. Vol. 100. p. 674-701.

Piquero, Alex R., David P. Farrington, and Alfred Blumstein. 2003. "The criminal career paradigm." In Michael Tonry (ed.), *Crime and Justice: A Review of Research*. Vol. 30. p. 359-506.

Piquero, Alex R., David P. Farrington, and Alfred Blumstein. 2007. *Key Issues in Criminal Career Research*. Cambridge. U.K. Cambridge University Press.

Prime, Julian, Steve White, Sarah Liriano, and Kinnari Patel. 2001. "Criminal careers of those born between 1953 and 1978." *U.K. Home Office Statistical Bulletin*. Vol. 4. no. 01. Available at: www.homeoffice.gov.uk/rds/pdfs/hosb401.pdf (accessed April 30, 2004).

Robinson, Paul. 2004. "Youth court statistics, 2002/03." *Juristat*. Vol. 24. no. 2. Statistics Canada Catalogue no. 85-002-XIE. Ottawa.

SAS Institute Inc. 2004. *SAS OnlineDoc® 9.1.3*. Cary. NC. SAS Institute Inc.

Satterthwaite, Franklin E. 1946. "An approximate distribution of estimates of variance components." *Biometrics Bulletin*. Vol. 2. p. 110-114.

Wolfgang, Marvin E., Robert M. Figlio, and Thorsten Sellin. 1972. *Delinquency in a Birth Cohort*. Chicago. University of Chicago Press.

Endnotes

1. Strictly speaking, the subjects of the study are persons born in 1987 or 1990 who allegedly committed criminal offences in the parts of Canada included in the study. These persons were not necessarily born in Canada, or even resident in Canada.
2. In this report, which deals exclusively with the police-reported criminal behaviour of persons younger than 18 years old, the terms "delinquency" and "crime" are used interchangeably.
3. The exception is a study by Laub & Sampson (2003), which followed a sample of delinquent boys to their 70th birthday, or their death, if it occurred earlier.
4. The term "offence" is used throughout this report to refer to a person's recorded involvement in a criminal incident. If a person is recorded by police as having committed more than one violation of the law in connection with the same incident, this is still counted as one offence. If more than one person (in the study population) is recorded as being implicated in the same incident, each person is counted as having committed one offence.
5. Persons born in 1987 were involved in 91,491 recorded incidents during the 10 years of observation from their 8th to their 18th birthdays. During 1995-2005, the population in the parts of Canada included in the study of the cohort born in 1987 averaged approximately 195,000. Thus the 10-year crime rate per capita is 91,491/195,000, or 0.47.
6. The *crime rate* is defined here as the number of recorded incidents involving persons in this birth cohort divided by the number of persons in the birth cohort . The 6-year per capita crime rate is 87,725/195,000, or 0.45.
7. Based on data from the aggregate UCR Survey, which provides data for the whole of Canada on youth crime, but not broken down by year of age.
8. They were involved in 31,588 recorded incidents during the 10 years of observation from their 5th to their 15th birthdays. During 1995-2005, the population in the parts of Canada included in the study of the cohort born in 1990 averaged approximately 207,400. Thus the 10-year crime rate per capita is 31,588/207,400, or 0.15.
9. This term ("offences against the person and reputation") is used in the *Criminal Code*, and is preferable to "violent offences", which is not. The Supreme Court of Canada recently adopted, for the purposes of the *Youth Criminal Justice Act*, a harm-based definition of "violent offence", from which it follows that whether or not an offence is "violent" must be determined from the facts of the particular case, and that not all offences against the person are necessarily "violent": "...while a harm-based definition may exclude assaults committed without causing, attempting to cause or threatening to cause bodily harm, these relatively minor assaults ought not to be considered "violent offences" within the meaning of s. 39(1)*(a)*" (R v. C.D., [2005] S.C.J. No. 79).
10. For a list of the specific types of offences included in each group, please see the Appendix. Persons who were implicated in more than one incident at a given age, where the multiple incidents involved alleged offences in different categories, are double- or triple-counted. For example, a person involved in an incident of assault and another incident of break and enter, would be counted in the prevalence statistics for both person and property crime. The UCR2 data do not distinguish which crime was allegedly committed by whom in incidents involving multiple alleged violations and multiple alleged offenders – and co-offending is relatively common among children and young persons (Carrington, 2002). Therefore, the most serious offence allegedly committed in the incident was not necessarily attributed by police to the person so classified in the analyses presented here; for example, if a 5 year old and an 11 year old were involved in an incident in which the former allegedly committed shoplifting and the latter allegedly committed assault, both persons would be classified in the UCR2, and therefore in these analyses, as apprehended in connection with the more serious offence, namely assault.

11. Two-tailed t-values for the differences in the crime rates at ages 8, 9, ... 14 are 1.15, -1.25, -0.05, -0.22, 2.36, 5.30, and 15.59. The t-statistics were calculated separately for each year-of-age group. For each age group, a file was created containing as many records as the sum of the total populations of the two birth cohorts at that age, including members of the cohort who were not alleged offenders at any age, and therefore not part of the study population. The records for persons accused at that age were coded with the number of recorded incidents for that person at that age. The remaining records for each age group, representing persons not accused at that age, were coded with zero incidents. Thus, the t-statistic for each age group compared the mean number of incidents allegedly committed by the entire population of each cohort, including non-offenders, at that age. These statistics should be interpreted with caution, since these are not normally distributed random samples. Satterthwaite's (1946) approximation for the degrees of freedom was used, since the variances of each pair of vectors of observations were unequal (SAS Institute, 2004). Only the tvalue for 12, 13, and 14 year olds are statistically significant at $p<.05$ ($p_{12}=.018$, $p_{13}<.0001$, $p_{14}<.0001$). The relatively large difference in the crime rates for 14 year olds in the two cohorts is probably due to a slight under-counting of offences in the data for 2005, which would have resulted in a slight under-count of offences committed by 14 year olds born in 1990 (and of 17 year olds born in 1987). The reason for under-counting in the 2005 data is that a small number of incidents occurring each year are not reported to the UCR2 Survey in time to be included in the data for that year. When the UCR2 data are updated the following year, data for the immediately preceding year are restated to include incidents reported in arrears. Thus, the data for all years except the most recent year (2005) had been updated when the data were provided for this study. In the following analyses, unless otherwise specified, rates, proportions, etc. for the age range where the two cohorts overlap (8 to 14 years) are given as the mean of the values for the two cohorts.
12. Two-tailed t-values for the differences in prevalence at ages 8, 9, ... 14, are 1.95, -1.36, 1.51, -1.85, 1.74, 1.65, 6.08. These statistics should be interpreted with caution, since these are not normally distributed random samples. Satterthwaite's (1946) approximation for the degrees of freedom was used, since the variances of each pair of vectors of observations were unequal (SAS Institute, 2004). Only the tvalue for 14 year olds is significant at $p<.05$ ($p_{14}<.0001$). This is probably due to a slight under-counting of offences in the data for 2005; see the preceding note.
13. To some extent, the low participation in recorded crime by children may reflect the process by which crime comes to be recorded by police. Most crime which comes to the attention of the police is reported by members of the public. If members of the public are less likely to report the minor crimes which are committed by younger children, then they will be under-represented in police statistics. Furthermore, police may be less likely to record the minor crimes which are committed by younger children, even when they are reported to police by the public (see the discussion in note 15 below of the jump in recorded crime at 12 years of age, shown in Figure 4).
14. Defined as: $(x_t - x_{t-1})/x_{t-1}$, where x_t is the proportion of the cohort recorded as offenders at age t.
15. It is possible that less police resources would be devoted to investigating minor incidents involving child perpetrators, and establishing their identities, since no charges could result. Also, even if the perpetrators' identities were known, police officers have some discretion in deciding whether or not to record a minor incident and its participants, particularly if the incident has not been referred to them by police dispatchers, and is therefore not already recorded on the police information system (Carrington and Schulenberg, 2003). In incidents involving child perpetrators, there is less incentive to go to the trouble of recording the incident and their names in the police information system, because they would not be chargeable. For both of these reasons, UCR2 counts of offenders under 12 years old may be underestimates, giving rise to a jump in recorded participation at the age of 12.
16. The term "sex" is used in this study in preference to "gender", since the UCR2 Survey records the "sex" of apprehended persons.
17. The increase in the sex ratio at the age of 9 occurs in both cohorts, and is due to an unexplained jump at that age in the number of recorded male offenders, while the number of recorded female offenders follows the overall age-related trend.
18. Two-tailed t-values for the differences between the cohorts in cumulative prevalence at ages 8, 9, ... 14 are -10.18, -8.47, -5.41, -5.23, -2.34, -0.56, 2.96. These statistics should be interpreted with caution, since these are not normally distributed random samples. Satterthwaite's (1946) approximation for the degrees of freedom was used, since the variances of each pair of vectors of observations were unequal (SAS Institute, 2004). Both the differences and the t-values decrease with age. Only the t-value for 13 year olds is *not* significant at $p<.05$ ($p_{13}=.58$). For an explanation of the difference in recorded cumulative prevalence at 14 years of age, see note 11 above.
19. This is the proportion of the cohort whose first recorded offence, or delinquent career *onset*, was at 15 years old. The age of onset of the career is discussed as a topic of interest in itself in a later section of this report.
20. Although the rate of increase is slowing (Chart 14).
21. "Other" offences include other Criminal Code offences, drug offences, and violations of other federal statutes (see Appendix Table A.1).

22. The minimum value on the y-axis is 1, since, by definition, an active offender is involved in at least one incident. The numbers of active offenders at each age, on which the mean incidences are based, are shown in Table A.2 in the Appendix. For the age range (8 to 14 years) where there are data for both cohorts, the age-specific incidence statistics are similar enough to each other that they can be treated as one population, except for the probable underestimate for 14 year olds born in 1990 (see note 11 above). Therefore, reported values for the age range 8-14 are the mean of the values for the two cohorts. Two-tailed t-values for the differences between the cohorts in incidence at ages 8, 9, ... 14 are: -1.48, 0.29, -1.99, 1.76, 0.27, 2.09, 4.25. These statistics should be interpreted with caution, since these are not normally distributed random samples. Only the t-values for 10, 13 and 14 year olds are significant at $p<.05$ ($p_{10}=.047$, $p_{13}=.037$, $p_{14}<.0001$).
23. The minimum value on the y-axis is 0, since an offender who is active at a given age may not be implicated in at least one incident of each type at that age. Indeed, few are, and the means are practically all below 1.
24. The most common offences against the administration of justice are violations of bail or probation conditions, and failure to appear for court. Other, much less common administrative offences include prison breach, escaping from custody, and other very infrequent offences (Appendix Table A.1).
25. Literally, "incapacity to do wrong". This is the English common law doctrine that children below a certain age (originally, 7 years old) are mentally incapable of forming criminal intent (Bala, 2003: 167-168).
26. The classic statement is by Moffitt (1993), but the distinction is employed and analyzed by many studies of delinquent and criminal careers.
27. Two-tailed t-values for the differences between the proportions of the two cohorts with ages of onset of 8, 9, ... 14 are 2.75, -1.09, 1.69, -1.56, 2.06, 1.87, and 5.78. These statistics should be interpreted with caution, since these are not normally distributed random samples. Satterthwaite's (1946) approximation for the degrees of freedom was used, since the variances of each pair of vectors of observations were unequal (SAS Institute, 2004). The t-values for ages 8, 12, and 14 are significant at $p<.05$ ($p_{08}=.006$, $p_{12}=.039$, $p_{14}<.0001$). See note 11 above for a discussion of the difference at the age of 14.
28. Or younger than 5 years, but that is very rare indeed.
29. If a "very early onset" offender is defined as one whose first recorded offence occurred before the 8th birthday, then only 0.22% of the 1990 cohort, or one in every 460 cohort members, falls into this category. To put it differently, less than 1% of recorded offenders aged 5 to 17 had very early onset. If early onset is defined as occurring before the 14th birthday, then 5.5% of cohort members, or 40% of recorded offenders in both cohorts, had early onset.
30. Defined as: $(x_t - x_{t-1})/x_{t-1}$, where x_t is the proportion of the cohort recorded as committing their first offence at age t.
31. This is the sum of the numbers of persons experiencing early onset at the ages of 5 to 11 inclusive. Only 0.4% of male cohort members, or 1% of recorded male offenders up to 17 years old, had very early onset (before the 8th birthday); the number are much lower among girls: 0.05% of female cohort members, or 0.3% of recorded female offenders. If early onset is defined as occurring before the 14th birthday, then it includes 7.5% of male cohort members, or 41% of recorded male offenders; and 3.4% of female cohort members, or 38% of recorded female offenders.
32. For example, a person whose first recorded property offence was at 9 years old, and first recorded "other" offence at 11 years old, and had no recorded offences against the person, would have two offence-specific ages of onset, and contribute to two offence-specific age-of-onset curves.
33. Some of the longer intervals – which ranged all the way up to almost 10 years – may be the invalid results of false positive matching of incidents involving different offenders (see the Methodology section).
34. Multiple incidents on the same day may be due to the UCR2 counting rules for incidents; see note 59 below.
35. If the population is restricted to repeat offenders with completed careers, then the mean career length increases to 1.23 years, or 15 months. The percentage of offenders with careers of 1 year or less decreases to 57%, and those with careers of more than 2 years account for 23% of the group.
36. "Substantive offences" refers to all offences except administrative offences (offences against the administration of justice). The most common administrative offences are violations of bail or probation conditions, or failure to appear for court. Other, much less common administrative offences include prison breach, escaping from custody, and other very infrequent offences. See Table A.1 in the Appendix for a detailed breakdown of offences allegedly committed by members of the study population.
37. I.e. the incidents which resulted in charges which were heard in youth court or adult criminal court.
38. There are fewer chronic offenders in the 1990 birth cohort, because it is observed in this study over a period of life during which recorded offending activity is less intense. Only 5% of offenders born in 1990 fall into the "chronic offender" category, but their average level of activity (9.3 incidents per offender) is almost as high as that of chronic offenders born in 1987. Chronic offenders account for 27% of incidents involving members of the 1990 birth cohort. Seventy-four percent of offenders born in 1990 had only one recorded incident between their 5th and 15th birthdays. Like the comparison made above of the mean number of incidents in the career, the distribution of members of the 1990 birth cohort into Wolfgang's three categories reflects both the less intense recorded substantive criminal activity of these younger children , and their not being at risk of committing the most common types of offences against the administration of justice until they reached the 12th birthday.

39. Calculation of the Gini coefficient requires unweighted data, so these values are based on raw frequencies rather than the weighted population data used elsewhere in this report. Another index of inequality is the standard deviation, which can be calculated using weighted data, but is less straightforward to interpret because it does not have a fixed maximum value. Values of the standard deviation of the distributions of recorded activity for the 1987 and 1990 cohorts are 4.5 and 2.5 respectively (Table 5).
40. Apart from an anomalous drop for offenders whose first incident was at the age of 9.
41. See "Age and the Rate of Offending", above.
42. The total frequency of recorded offending of offenders whose careers began during the last two years of observation (2004 and 2005, indicated by dotted lines in Charts 32 and 33) may be underestimated because of data truncation: that is, because their careers continue into the unobserved period after 2005 (see "The Duration of the Delinquent Career", above). These are offenders whose careers began at the ages of 16 and 17 in the 1987 birth cohort, and 13 and 14 in the 1990 cohort. While such underestimation may also apply in the case of other offenders, it is unlikely to be related to the age of onset, and is therefore unlikely to bias the analyses reported here, as the analysis of the duration of careers (above) found that, with the exception of careers beginning in the last two years of the period of observation, late-onset offenders were probably no more likely than early-onset offenders to have careers which continued past the end of the observation period. There is no doubt that in restricting analysis to activity up to a certain age, this study does not provide a true estimate of the *lifetime* delinquent and criminal activity of these offenders - nor does it attempt to - but the impact of the restricted period of observation should be approximately the same, regardless of the age of onset (except for the last 2 years).
43. I thank Paul Verbrugge for pointing this out.
44. See "Age and the Rate of Offending", above.
45. As with the earlier analyses, the percentages for offenders with onset in the last 2 years of the observation period are probably depressed by the truncation of the data. Therefore, the increase in percentages up to the age of onset of 14 in the 1987 birth cohort is probably more meaningful than the decreases at 13 and 14 in the 1990 cohort. Similarly, the decreases for those with ages of onset of 16 and 17 are probably exaggerated by data truncation.
46. See related notes on earlier analyses.
47. With recorded onset before the 12th birthday.
48. Whose recorded onset occurred on or after the 12th birthday.
49. In order to make the analyses more consistent with other research, offences against the administration of justice are not considered when classifying delinquent careers as specialized or versatile. For example, a person whose delinquent career included only offences against the person and administrative offences would be classified as specializing in the former. However, the presence or absence of administrative offences is noted in the analyses, as a separate dimension of specialization/versatility. This is the procedure that was adopted by research on "court careers" published by the Canadian Centre for Justice Statistics (Carrington et al., 2005).
50. The UCR2 coding scheme specifies that if an incident involves multiple criminal violations, the four most serious are to be coded, in decreasing order of seriousness. For example, if an incident involved an aggravated assault, a break and enter, and a breach of a probation order, these three violations would be coded, in the order given.
51. Careers with 13 or more incidents (for offenders born in 1987) or 9 or more incidents (for the 1990 birth cohort) are combined into one group in Chart 36, since the numbers of specialized offenders become very small (less than 10) in these high-frequency careers.
52. The breakdown of repeat offenders by cohort and age of onset is shown in Table A.3 in the Appendix.
53. The results are similar for offenders born in 1990, but are obscured by small cell sizes.
54. A decrease in specialization over the ages of onset of 9 to 13 does not occur in the curve for careers consisting of 4 incidents, but it does occur over the range from 8 to 13 years. The trends for ages of onset from 8 to 12 years in this curve and the curve for careers consisting of 3 incidents must be interpreted with caution, as there are substantial fluctuations due to small cell sizes.
55. "Substantive offences" refers to all offences except administrative offences (offences against the administration of justice). The most common administrative offences are violations of bail or probation conditions, or failure to appear for court. Other, much less common administrative offences include prison breach, escaping from custody, and other very infrequent offences. See Table A.1 in the Appendix for a detailed breakdown of offences allegedly committed by members of the study population.
56. Because of small numbers, only the first 18 substantive incidents in the career are shown for offenders born in 1990. For the same reason, the 26th and all subsequent substantive incidents are combined for offenders born in 1987.
57. It is based on the average length of prison sentence imposed on convicted charges between 1994/95 and 2000/01 in criminal court (Robinson, 2004: 10). Its value is inversely related to the seriousness of the offence, and ranges from 1 for "First degree murder" to 112 for "Other federal statute offences". This is an ordinal (ranked) scale, and strictly speaking should not be used in analyses which are based on arithmetic operations such as averaging. However, use of such ordinal seriousness scales in analyses using averaging are common in research on career escalation (e.g. Kyvsgaard 2003: Chapter 13).

Catalogue no. 85-561-MIE2007009

58. In fact, the number and identities of the police services included in the study changed slightly each year, because of mergers and closings of individual police services, particularly in the province of Québec. However, the selection process was done in such a way that the geographic areas which were under the jurisdiction of the police services included in the study remained approximately constant over the period of observation.
59. The concept of the *criminal incident* used in the UCR2 is similar to the *criminal event* in criminology: that is, it occurs at a particular time in a particular place (Kennedy and Sacco, 1996). Normally, it is an activity captured in one police occurrence report. However, the Canadian Centre for Justice Statistics (2006) uses a definition of the incident which may differ in certain circumstances from the criminal event or the police occurrence: for example, traffic and non-traffic violations are scored as separate incidents even if they are perpetrated by the same offender at the same time and place. On the other hand, if the same offence is committed repeatedly against the same victim by the same offender over a long period of time, and only comes to the attention of the police at one point in time, that is recorded as one incident.
60. The term used by the Canadian Centre for Justice Statistics is "charged/suspect-chargeable (accused)".
61. The UCR2 records crime by alleged offenders as young as 3 years of age, but examination of data for 3 and 4 year olds born in 1992 indicated that there were so few of them that any conclusions concerning them would be unreliable.
62. This section is based on the corresponding section of the companion report (Carrington et al., 2005).
63. See Armstrong (2000) for details of the Soundex code, and a discussion of the issues surrounding its use in record matching.
64. The quotation marks are used because these "individuals" may instead be more than one person, erroneously aggregated together.

Appendix 1

Table A.1

Recorded offences committed by the study population, by detailed offence type and birth cohort

Type of offence	1987 cohort		1990 cohort	
	number	percent	number	percent
Offences against the person				
First degree murder	17	0.02	0	0.00
Second degree murder	11	0.01	0	0.00
Manslaughter	4	0.00	0	0.00
Criminal negligence causing death	2	0.00	0	0.00
Other related offences causing death	1	0.00	0	0.00
Attempted murder	33	0.04	2	0.01
Conspire to commit murder	1	0.00	0	0.00
Aggravated sexual assault	7	0.01	2	0.01
Sexual assault with a weapon	10	0.01	7	0.02
Sexual assault	949	1.04	533	1.69
Other sexual crimes	164	0.18	83	0.26
Aggravated assault (level 3)	194	0.21	34	0.11
Assault with a weapon (level 2)	3,089	3.38	1,112	3.52
Assault (level 1)	8,520	9.31	3,862	12.23
Unlawfully causing bodily harm	38	0.04	11	0.03
Discharge a firearm with intent	13	0.01	3	0.01
Assaults against officer	386	0.42	55	0.17
Criminal negligence causing harm	18	0.02	1	0.00
Other assaults	127	0.14	35	0.11
Kidnapping	145	0.16	32	0.10
Hostage taking	1	0.00	1	0.00
Abduction under 14 (not guardian)	3	0.00	0	0.00
Abduction under 14 (guardian)	1	0.00	0	0.00
Robbery	2,736	2.99	579	1.83
Extortion	167	0.18	41	0.13
Criminal harassment	350	0.38	216	0.68
Utter threats to person	2,751	3.01	1,087	3.44
Explosives causing death or harm	1	0.00	0	0.00
Arson (disregard for human life)	15	0.02	4	0.01
Other violent violations	41	0.04	14	0.04
Offences against property				
Arson	741	0.81	540	1.71
Break and enter	7,385	8.07	2,093	6.63
Theft over $5,000	1,023	1.12	100	0.32
Theft of a motor vehicle over $5,000	491	0.54	151	0.48
Theft from motor vehicle over $5,000	17	0.02	0	0.00
Theft $5,000 or under	20,877	22.82	9,244	29.26
Theft of a motor vehicle $5,000 or under	938	1.03	349	1.10
Theft from a motor vehicle $5,000 or under	1,032	1.13	457	1.45
Have stolen goods	4,337	4.74	1,243	3.94
Fraud	1,367	1.49	180	0.57
Mischief	394	0.43	166	0.53
Mischief over $5,000	293	0.32	177	0.56
Mischief $5,000 or under	7,909	8.64	3,929	12.44

Catalogue no. 85-561-MIE2007009

Table A.1

Recorded offences committed by the study population, by detailed offence type and birth cohort (continued)

Type of offence	1987 cohort		1990 cohort	
	number	percent	number	percent
Other offences				
Bawdy house	2	0.00	0	0.00
Living off avails of prostitution, less than 18yrs	5	0.01	0	0.00
Procuring	1	0.00	0	0.00
Obtain/communicate for sex, less than 18yrs	3	0.00	3	0.01
Other prostitution	37	0.04	1	0.00
Betting house	1	0.00	0	0.00
Other gaming and betting	1	0.00	0	0.00
Explosives	26	0.03	4	0.01
Prohibited weapon	43	0.05	5	0.02
Restricted weapon	8	0.01	0	0.00
Weapon transfer/serial numbers	1	0.00	0	0.00
Other offensive weapons	87	0.10	34	0.11
Using firearms/imitation	26	0.03	7	0.02
Weapons possession contrary to order	30	0.03	6	0.02
Weapons possession	1,055	1.15	319	1.01
Pointing a firearm	123	0.13	20	0.06
Unsafe firearms storage	8	0.01	1	0.00
Bail violations	5,317	5.81	1,043	3.30
Counterfeiting currency	281	0.31	44	0.14
Disturb the peace	248	0.27	76	0.24
Escape custody	429	0.47	54	0.17
Indecent acts	93	0.10	40	0.13
Produce/distribute child pornography	9	0.01	3	0.01
Public morals	5	0.01	3	0.01
Luring a person under 18 via computer	1	0.00	2	0.01
Obstruct officer	447	0.49	41	0.13
Unlawfully at large	165	0.18	17	0.05
Trespass at night	110	0.12	21	0.07
Fail to appear	1,374	1.50	244	0.77
Breach of probation	1,417	1.55	145	0.46
Threatening/harassing phone calls	258	0.28	123	0.39
Offences against public order	79	0.09	43	0.14
Firearms and other offensive weapons	7	0.01	0	0.00
Offences against administration of justice	350	0.38	126	0.40
Sexual offences, public morals, disorderly conduct	18	0.02	3	0.01
Invasion of privacy	2	0.00	1	0.00
Offences against person and reputation	110	0.12	32	0.10
Offences against the right of property	344	0.38	55	0.17
Fraudulent transactions (contracts and trade)	8	0.01	1	0.00
Intimidation of justice system participant	1	0.00	0	0.00
Wilful and forbidden acts (certain property)	75	0.08	32	0.10
Offences related to currency	11	0.01	5	0.02
Proceeds of crime	5	0.01	2	0.01
Attempts, conspiracies, accessories	112	0.12	34	0.11
Commit offence for criminal organization	1	0.00	0	0.00
All other *Criminal Code*	125	0.14	17	0.05
Possess heroin	1	0.00	1	0.00
Possess cocaine	145	0.16	14	0.04
Possession Other *Controlled Drug Substance Act* (CDSA)	464	0.51	108	0.34
Possess cannabis	6,208	6.79	1,617	5.12
Trafficking heroin	7	0.01	1	0.00
Trafficking cocaine	241	0.26	8	0.03
Trafficking other CDSA	198	0.22	36	0.11
Trafficking cannabis	1,366	1.49	284	0.90
Import/produce cocaine	0	0.00	1	0.00
Import/produce other CDSA	5	0.01	1	0.00
Import/produce cannabis	2	0.00	0	0.00
Produce cannabis	51	0.06	7	0.02
Proceeds of crime (CDSA)	1	0.00	0	0.00
Food & Drug Act	1	0.00	0	0.00
Canada Shipping Act	2	0.00	0	0.00

Table A.1

Recorded offences committed by the study population, by detailed offence type and birth cohort (concluded)

Type of offence	1987 cohort		1990 cohort	
	number	percent	number	percent
Excise Act	0	0.00	1	0.00
Offences under the *Young Offenders Act or Youth Criminal Justice Act*[1]	2,502	2.73	478	1.51
Immigration and Refugee Act	7	0.01	1	0.00
Other federal statutes	8	0.01	6	0.02
Dangerous operation of motor vehicle (death)	1	0.00	0	0.00
Dangerous operation of motor vehicle (bodily harm)	20	0.02	0	0.00
Dangerous operation	268	0.29	32	0.10
Dangerous operation evading police – causing bodily harm	4	0.00	0	0.00
Dangerous operation of motor vehicle evading police	81	0.09	15	0.05
Impaired operation motor vehicle (death)	1	0.00	0	0.00
Impaired operation motor vehicle (bodily harm)	4	0.00	1	0.00
Impaired operation motor vehicle (over 80mg)	258	0.28	4	0.01
Failure to provide breath sample	8	0.01	0	0.00
Fail to stop or remain	138	0.15	18	0.06
Driving while prohibited	36	0.04	0	0.00
Unsafe operation of motor vehicle	5	0.01	4	0.01
Total	91,491	100.00	31,588	100.00

0 true zero or a value rounded to zero

1. The great majority of offences under the *Young Offenders Act* or *Youth Criminal Justice Act* allegedly committed by members of the study population are failures to comply with a community disposition.

Note: Offences against the administration of justice are in bold font.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Catalogue no. 85-561-MIE2007006

Table A.2

Numbers of active offenders, by age and sex

Age	Total	Male	Female
5	65	59	5
6	136	122	14
7	244	213	31
8	725	612	114
9	1,162	992	170
10	1,722	1,386	336
11	2,841	2,181	661
12	6,838	4,799	2,040
13	12,156	8,167	3,989
14	17,270	11,524	5,747
15	10,944	7,701	3,244
16	11,649	8,782	2,867
17	11,338	8,827	2,511

Note: Numbers for ages 8 to 14 include members of both cohorts.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Table A.3

Numbers of repeat offenders by cohort and age of onset

Age	1987 cohort	1990 cohort
5 and 6	...	76
7	...	94
8	184	152
9	242	228
10	415	305
11	605	485
12	1,515	1,055
13	2,198	1,408
14	2,807	1,027
15	2,817	...
16	2,079	...
17	1,062	...
Total	13,924	4,829

... not applicable

Source: Statistics Canada, Canadian Centre for Justice Statistics, Incident-Based Uniform Crime Reporting (UCR2) Survey, Linked 11-year data file.

Canadian Centre for Justice Statistics

Crime and Justice research paper series

Cumulative index

The **Canadian Centre for Justice Statistics** (CCJS) was created in 1981 as a division of Statistics Canada. The CCJS is the focal point of a federal-provincial-territorial partnership for the collection of information on the nature and extent of crime and the administration of civil and criminal justice in Canada. This partnership, known as the "National Justice Statistics Initiative", has become the international model of success on how to develop, implement and manage an effective national justice statistics program. Its analytical output appears in the flagship publication *Juristat* (http://www.statcan.ca/english/IPS/Data/85-002-XIE.htm), in various annual and biennieal publications, and in the *Crime and Justice research paper series* (http://www.statcan.ca/english/IPS/Data/85-561-MIE.htm).

Catalogue no. 85-561-MIE2007009

Following is a cumulative index of Canadian Centre for Justice Statistics research papers published to date:

Crime and Justice Research Paper Series – Research papers

85-561-MIE2003001	An examination of sex differences in delinquency
85-561-MIE2003002	Childhood aggression and exposure to violence in the home
85-561-MIE2003003	Prior police contacts and police discretion with apprehended youth
85-561-MIE2004004	Neighbourhood characteristics and the distribution of crime in Winnipeg
85-561-MIE2005005	Exploring crime patterns in Canada
85-561-MIE2005006	Court careers of a canadian birth cohort
85-561-MIE2006007	Neighbourhood characteristics and the distribution of crime on the Island of Montréal
85-561-MIE2006008	Neighbourhood characteristics and the distribution of crime in Regina
85-561-MIE2007009	The Development of Police-reported Delinquency Among Canadian Youth Born in 1987 and 1990